

Workbench

November
December
1958



Toy Hand Drill
For A Youngster



Roll Out The
Pictures On This
Drawing Board



Combination
Blackboard and
Train Table



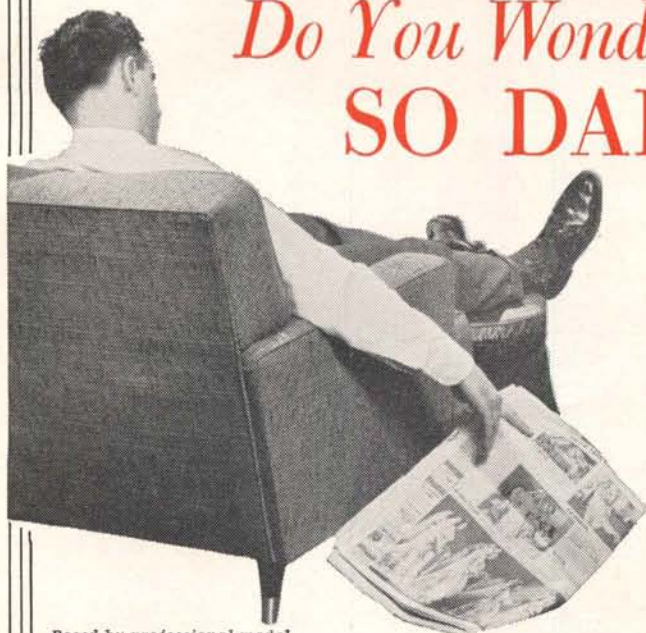
Photographer's
Darkroom Cabinet



SPECIAL SECTION:
With Santa Claus in His Workshop

A DRAMATIZED STORY THAT COULD HAPPEN TO YOU!

Do You Wonder What Makes You SO DARN TIRED?



Posed by professional model.

I used to feel weak and run-down from the moment I woke up in the morning to the time I tumbled into bed at night. Believe me, doing a full day's work is hard enough even when you feel good. But trying to be a good worker, husband and father when you're "dead on your feet" would make any man a nervous wreck!

As if being tired at night wasn't bad enough, I found myself getting upset by almost everything. I was "touchy" in the office, cross and irritable with my own children. I'd start arguments with my wife over the smallest things. I finally realized that something had to be done — so I went to see our family doctor.

After examining me, the doctor explained that my tiredness and nervousness was caused by a lack of important vitamins and minerals in my diet. This deficiency, he explained, caused men and women to feel run-down and irritable. To help correct my condition he recommended I add a good food supplement to my daily diet.

That's when I sent away for a trial supply of Vitasafe High-Potency Capsules that I had seen advertised. In just a few short weeks my energy came back. I felt like a new man, and I was glad to continue with the wonderful Vitasafe Plan. If you feel tired, nervous and miserable as I did, why not see how Vitasafe Capsules may help you, too? Send for your trial supply by mailing the coupon today!

25¢ just to help cover shipping expenses of this

FREE 30 days supply HIGH-POTENCY CAPSULES

LIPOTROPIC FACTORS, MINERALS and VITAMINS

Safe, Nutritional Formula Containing 27 Proven Ingredients: Glutamic Acid, Choline, Inositol, Methionine, Citrus Bioflavonoid, 11 Vitamins (Including Blood-Building B-12 and Folic Acid) Plus 11 Minerals

To prove to you the remarkable advantages of the Vitasafe Plan . . . we will send you, without charge, a 30-day free supply of high-potency VITASAFE C.F. CAPSULES so you can discover for yourself how much stronger, happier and peppier you may feel after a few days' trial! Just one of these capsules each day supplies your body with over *twice* the minimum adult daily requirement of Vitamins A, C, and D—*five times* the minimum adult daily requirement of Vitamin B-1, and the *full* concentration recommended by the Food and Nutrition Board of the National Research Council for the other four important vitamins! Each capsule contains the amazing Vitamin B-12, a remarkable nutrient that helps nourish your body organs. Vitasafe Capsules also contain Glutamic Acid, an important protein derived from natural wheat gluten. And now, to top off this exclusive formula each capsule also brings you an important dosage of Citrus Bioflavonoid. This formula is so complete it is available nowhere else at this price!

You can use these Capsules confidently because U. S. Government regulations demand that you get exactly what the label states — pure, safe ingredients. The beneficial effects of these ingredients have been proven time and time again.

**WHY WE WANT YOU TO TRY
A 30-DAY SUPPLY — FREE!**

So many persons have already tried VITASAFE C.F. CAPSULES with such outstanding results . . . so many people have written in telling us how much better they felt after only a short trial . . . that we are absolutely convinced that you, too, may experience the same feeling of improved well-being after a similar trial. In fact, we're so convinced that we're willing to back up our convictions with our own money. You don't spend a penny for the vitamins! All the cost and risk are *ours*.

**AMAZING PLAN SLASHES VITAMIN
PRICES ALMOST IN HALF**

With your free vitamins you will also receive complete details regarding the

benefits of an amazing new Plan that provides you regularly with all the factory-fresh vitamins and minerals you will need. *You are under no obligation to buy anything!* If after taking your free Capsules

SPECIAL FORMULA FOR WOMEN

Women may also suffer from lack of pep, energy, and vitality due to nutritional deficiency. If there is such a lady in your house, you will do her a favor by bringing this announcement to her attention. Just have her check the "Woman's Formula" box in the coupon.

for three weeks you are not entirely satisfied, simply return the handy postcard that comes with your free supply and that will end the matter. Otherwise it's up to us—you don't have to do a thing—and we will see that you get your monthly supplies of capsules *on time* for as long as you wish, at the low money-saving price of only \$2.78 per month (a saving of almost 50%). Mail coupon now!

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Address.....

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Zone.....

State.....

This offer is limited to those who have never before taken advantage of this generous trial. Only one trial supply of each formula per coupon.

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Yours
FREE
Retail Value
\$5.00



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IN CANADA: 394 Symington Ave., Toronto 9, Ontario

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EACH DAILY VITASAFE CAPSULE FOR MEN CONTAINS

Choline	31.4 mg.	Vitamin C	75 mg.	Phosphorus	58 mg.
Bitartrate	5 mg.	Vitamin B ₁	5 mg.	Iron	30 mg.
Inositol	15 mg.	Vitamin B ₂	2.5 mg.	Cobalt	0.04 mg.
dl-Methionine	10 mg.	Vitamin B ₆	0.5 mg.	Copper	0.45 mg.
Glutamic Acid	50 mg.	Vitamin B ₁₂	2 mcg.	Manganese	0.5 mg.
Lemon Bioflavonoid	40 mg.	Niacin Amide	40 mg.	Molybdenum	0.1 mg.
Complex	5 mg.	Calcium		Iodine	0.075 mg.
Vitamin A	12,500 USP Units	Pantothenate	4 mg.	Potassium	2 mg.
Vitamin D	1,000 USP Units	Vitamin E	2 I.U.	Zinc	0.5 mg.
		Folic Acid	0.5 mg.	Magnesium	3 mg.
		Calcium	75 mg.		

Compare the richness of this formula with any other vitamin and mineral preparation.

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Blackboard and Train Table—Ralph G. Smith, Jr.
Photographer's Darkroom Cabinet, Courtesy of Douglas Fir Plywood Association.

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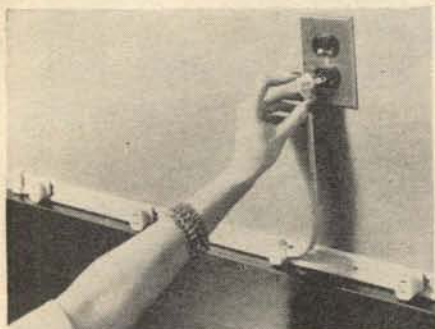
City Zone State



keeping up with craft and home products

In communicating with companies whose products are described in this department, please mention **WORKBENCH**.

Strip Provides Electrical Outlets



THE MANUFACTURERS of Electrostrip—a continuous vinyl plastic strip to which electrical outlets can be twisted in at any point—have a new variation of their product with emphasis on convenience and easy installation and use.

Called the EK-4, or "four-footer," it consists of four feet of Electrostrip, three receptacles and a new, simple polarized plug-in connector, and mounting screws.

The new EK-4 Electrostrip needs nothing but a screwdriver to install. There are no wiring problems, according to the manufacturer. Pre-drilled holes every 8" simplify the job. The "four-footer" mounts readily on practically any surface and without breaking into plaster.

This new "strip" is simply plugged into the existing wall plug. The three twist-in receptacles may then be placed anywhere along the "strip" for the most convenience or best appearance. They may be moved to another location at any time. The package was designed especially for use in bedrooms and kitchens.

The "four-footer" comes in a light ivory color, but may be painted to match any color scheme. The plastic "strip" may be bent to go around corners or other obstacles where necessary.

Manufactured by Bull Dog Electric Products Company, the new EK-4 Electrostrip will be available in most hardware stores, department stores, supermarkets, and other retail outlets throughout the country. Retail at \$2.95.

Masonry Repair Compound

HERE'S THE latest and newest product in kit form for filling and restoring concrete and cement surfaces.

Patch-Crete is an all purpose Plastic latex cement patching compound. No water necessary. Everything needed is in the kit: Patch-Crete Powder — Patch-Crete Liquid — a trowel. Mix and fix a small or large amount. Use product only as needed, then put the balance on the shelf till next time. Sticks like glue to wood, brick, stone, cement, cinderblock and masonry. Sets in fifteen minutes, walk on it in two hours, drive on it in four hours. Whether it is a cracked swimming pool, or a broken garage floor or to level that broken patio, Patch-Crete quickly, easily does the job. Patch-Crete patch is stronger than the old concrete it is replacing. Always ready, eliminates chipping, priming, curing. An all weather product. Good indoors or outdoors.

For small homeowners, institutions, motels, hotels, etc. Packed in attractive lithographed cans 8 lb., 14 lb., 52 lb., 64 lb. sizes. Free literature available — Camp Chemical Co., Inc., Brooklyn 15, New York.

Paint Holder Clamps To Ladder



LOCKHART LOCK-ON, a revolutionary new pail holder for painters and window washers, has been introduced by the Lockhart Manufacturing Corp. of Detroit, Michigan.

The new holder clamps under the lip of the pail and a springlock holds it firmly in place, preventing tipping or splashing while it is in use. It adjusts to all angles of the ladder

and attaches to either side of the ladder, instead of on the rungs above or below the user.

With the new Lockhart Lock-on it is no longer necessary to reach through the rungs of the ladder to a swaying pail that may splash its contents. In addition to making pail use easier, it eliminates much waste of paint and time.

The Lock-on holder also serves as an easy-grip handle for carrying the paint pail up and down the ladder or to and from the job.

Compact Six-Volt Torch



A NEW four-cell, six-volt super-powerful torch—the first ever produced for the consumer market—has been developed by Burgess Battery Company.

Designed to combine the compact handiness of the family flashlight with the long distance carrying power of portable electric lanterns, but without a conventional six-volt lantern's bulk and weight, the unusual Satellite torch weighs only 22 ounces. It produces a beam of light with twice the intensity of standard two cell flashlights and has a quarter-mile nighttime penetration.

A special built-in bulb-protector inside the lighthouse shields the bulb from breakage by dropping or rough handling. A new type of steel, distortion-proof reflector, coated with vaporized aluminum to multiply the light output is also used. This new reflector coating prevents tarnishing or peeling, Burgess engineers relate. It uses regular D-cell batteries. Retail price is \$3.29.

Rechargeable Dry Shaver



ROYALMATIC DELUXE—rechargeable dry shaver—brings a comfortable shave to men in all situations where electrical outlets are not available. Campers, fishermen, sportsmen, travelers, salesmen on the road—all will find this amazing shaver a convenient and welcome traveling companion.

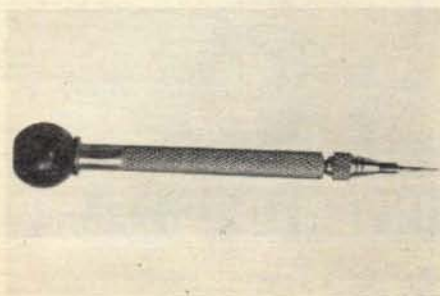
The revolutionary Royalmatic Deluxe features precision engineering; its accumulators and complete charging set are built in. It can be used for years because the razor is recharged by simply plugging it into an electrical outlet for a few hours or overnight. On just this power the shaver will operate (without a cord) for a full week of daily shaves—or retain its power for six months if used only occasionally. No battery or cords.

The cutting head of the Royalmatic Deluxe is fitted with full width blades rotating at nearly 4,000 revolutions per minute. Because of its distinctive self-sharpening feature, the razor assures knife-sharp shaving of the most resistant beard.

Royalmatic Deluxe is a product of quality craftsmanship from Western Germany. In its zippered leather case, it fits snugly inside briefcase, glove compartment, or campers' storage space. Guaranteed for one year against all defects due to flaws in materials.

Available for \$19.95 from the Royalmatic Deluxe Cordless Shaver Company at 1601 Grande Vista Avenue, Los Angeles 23, California.

Spring-Tensioned Screwdriver



A SPRING-TENSIONED screwdriver originally designed for use by telephone installers and repairmen is now

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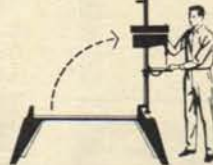
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¾ h.p. motor \$46.95

Take advantage of this amazing "Name-Your-Deal" offer—now—at your leading hardware or department store, lumber yard or Montgomery Ward. *Special offer:* Write today for your

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DON-BAR CO. Dept. L272 3511 W. Armitage Ave. Chicago 47, Ill.

Craft and Home Products

available to anyone who works with miniature screws, reports Suttle Equipment Corporation, the manufacturer.

This specialized tool contains a spring-tensioned, pointed plunger which runs through the bit to exert a steady pressure upon the small screw or piece part. This insures positive seating, whether or not there is a hole in the screw slot.

The long-lasting bit is double-ended, with two sets of points, one set on either end. These case-hardened bits will accommodate the end of practically all miniature screws.

The company reports this high-quality tool is also easy to use, even in confined spaces. The screwdriver is knurled for almost its entire 4 1/2 inch length for the surest grip possible. The handle is also equipped with a rotating knob which permits the screwdriver to turn easily in the hand as it is used.

Complete information and price quotations on this work-saving tool may be obtained by writing to the Suttle Equipment Corporation, 135 S. LaSalle Street, Chicago 3, Illinois.

Simplified Chrome Plating



TWO NEW kits that enable even a child to chrome plate any previously plated metal in seconds have been introduced by Albicrome Products, Boston, Massachusetts.

Rusted, worn and corroded chrome surfaces on automobile bumpers and trim, also on faucets, golf shafts, doorknobs, and even silverplate, to mention only a few applications in the home, now can be replated easily with professional results in seconds, without using special equipment, removing parts or being inconvenienced in any way.

To rechrome previously plated metals fast, the user need only apply Albicrome Crome Chelate to a clean and smooth surface with a piece of catalizer wool. Mild exothermic heat (chemically produced) deposits the liquid chrome alloy onto the metal surface as a solid metal plating. Then the metal is simply rinsed with water, dried and buffed to a beautiful, professional finish with fine steel wool.

Shepherd Scene

A wonderful Christmas scene showing the Three Shepherds, surrounded by their flock, grazing at "Star of Bethlehem." Patterns nearly life size. Easy to make. Only \$2.00.

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Craft and Home Products

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Portable Power, Speed, Light Control

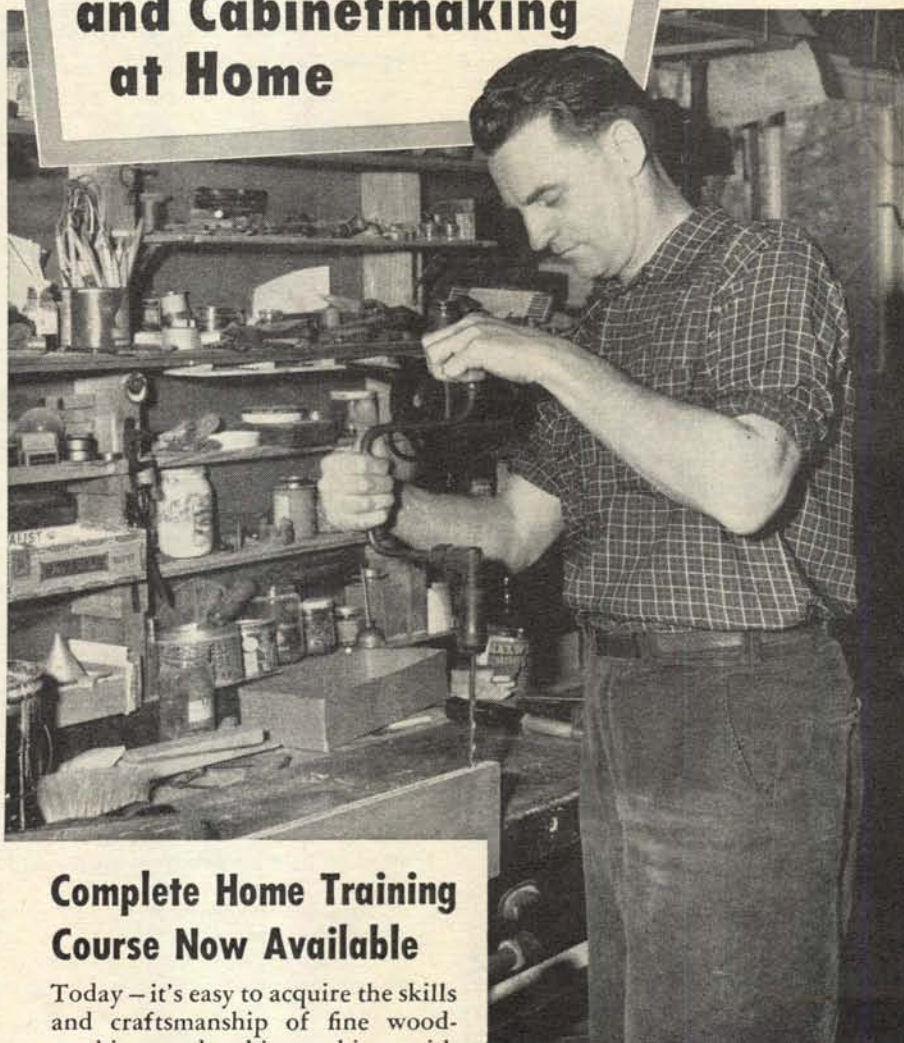


INVALUABLE FOR hundreds of do-it-yourself, classroom, industrial and commercial applications, new Powerstat type 2PF10 smoothly, steplessly controls the power, speed or light output of most electrical apparatus having current requirements up to 1.0 ampere. Only a few of its more popular uses are to reduce power tool speed for delicate operations; to control incandescent lamp intensity up to 150 watts; as a small motor control for laboratory mixers and centrifuges; for small heaters, soldering irons and test equipment.

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Craft and Home Products

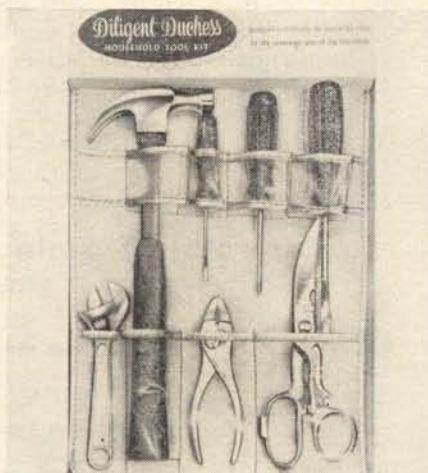
Adapts Kitchen Mixer to Drill



THE G. K. Stewart Company announces an adaptor that will change all standard kitchen mixers to a 1/4" drill. All mixers have plenty of power, even the small hand or portable type. The adaptor is fitted to the mixer by simply removing the beater and inserting the adaptor in its place. It comes equipped with a genuine Jacobs key chuck and nine high-grade chrome alloy tool steel drills in the following sizes: 1/16", 5/64", 3/32", 7/64", 1/8", 9/64", 5/32", 3/16" and 1/4".

This adaptor, chuck and drills may be obtained by sending a description of your kitchen mixer, as to make and model, together with your check or money order in amount \$4.95 to the G. K. Stewart Co., 183 Mt. Curve Blvd., St. Paul 5, Minnesota. Postage is prepaid.

Tools Designed for Women



DILIGENT DUCHESS Household Tool Kits are designed specifically for use in the home by women. The tools are relatively small, light and downright pretty. They are designed as a matched set. They are organized and centralized where most readily accessible through use of a fitted kit

which hangs on the inside of the door to the broom closet—not scattered throughout the household in the kitchen, in the workshop, in the garage, and in the storage compartment of the automobile. They are beautiful tools, and also professional tools of the very finest quality.

Diligent Duchess Household Tool Kits are available in two distinctive lines, a DeLuxe line featuring chrome-plated tools, and a Regal line featuring 22-karat gold-plated tools. Both lines are available in a choice of three sizes, assortments of six, seven, and ten tools. Retail prices range from \$9.95 to \$49.95. For additional information write Consolidated Tool Company, 2209 Santa Fe Avenue, Los Angeles 58, California.

Table Keeps Bottles Cool



CALLED PARTY-COOLER, a new, cleverly designed circular table is announced by Hocar Manufacturing Company, 2569 North Clark Street, Chicago 14, Illinois. The table ingeniously solves the problem of maintaining bottled refreshments cool during social gatherings of children or grown-ups, whether indoors, on the porch, patio or lawn.

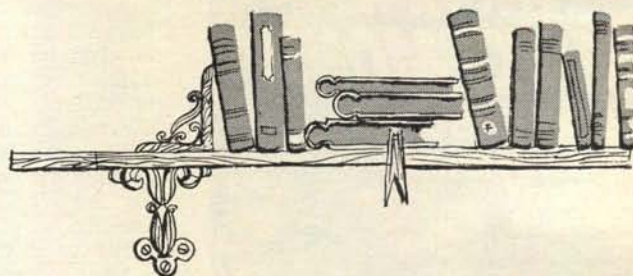
Made of aluminum, "Party-Cooler" has an over-all diameter of 23". In the center is a sunken nonbreakable, chip-proof, dent-proof rigid Polyethylene ice bucket 12" in diameter and 7 1/2" in depth, the flare-top rim of which comes flush with the table level. The bucket is equipped with 2" brass rings for easy lifting and decoration.

The table is supported by three 3/8" chrome plated rods held in position by a ring. The rods terminate into 3/4" ball feet. A 12" serving tray in matching finish is included with the set.

"Party-Cooler" is ideal for all festive occasions. The bucket holds 15 bottles embedded in chipped ice or cubes. The table section around the bucket holds snacks, empty bottles, etc. Retail price, complete, including serving tray, in choice of copper, brass or silver finish, \$14.95.

the craft and home bookshelf

Reviews By Theodore M. O'Leary



Heirloom Furniture
by Franklin H. Gottshall
154 pages; illustrated; the Bruce Publishing Co.,
Milwaukee, Wisconsin; \$9.50.

THIS IS the sort of book that will fill the heart of the experienced home craftsman with the same sort of eagerness with which a confirmed golfer greets a sunny Saturday morning in June. He just won't be able to wait to get started.

Franklin Gottshall, who has spent most of his adult life studying, making and teaching the making of classic pieces of American and English furniture, presents in "Heirloom Furniture" all the information necessary for the reproduction of 35 pieces of period furniture. The pieces are those which Mr. Gottshall thinks are the best done by himself and by his most gifted students over a long period of years. One of the pieces, a Duncan Phyfe desk, was built for the late Henry Ford at his request while he was visiting the Martha Berry college where Mr. Gottshall was once a professor.

In a foreword, William C. Bruce writes of Mr. Gottshall: "He has correctly held that beauty in furniture is never the result of an accident. True beauty is rather the outcome of a combination of careful planning and of observation and study of the rules of design tested and handed down by the masters of bygone generations; it is also a result of keen understanding of the surroundings into which the given pieces are to fit."

Mr. Gottshall's book is primarily addressed to the craftsman who is already familiar with the basic principles, techniques and skills of wood-working and cabinetmaking. In his instructions Mr. Gottshall makes a point of showing only the best construction. Joints are mortise and tenon, drawers and other members are dovetailed. He advises veneering where it should be used for lighter construction or to achieve beauty of grain. Special attention is paid to such matters as how to upholster some chairs and rush bottom others. One chapter is devoted entirely to finishes.

AT THE beginning of each chapter Mr. Gottshall comments on the origin and value of the particular piece of furniture involved. He gives a complete bill of materials and, of course, detailed instructions for every process

involved in the construction of the piece. Anywhere from 10 to 30 detailed illustrations and drawings are provided for each piece of furniture. There are photographs of each piece after completion.

Because each piece of furniture is an important piece, and because prospective users of this book will undoubtedly want to know just what projects they will find in it, here they are, in the order in which Mr. Gottshall presents them: Stauffer corner cupboard; Unger corner cupboard; Hepplewhite dining room suite—dining table; Hepplewhite dining room suite—sideboard; Hepplewhite dining room suite—side chair and armchair; Welsh dresser; Chippendale lowboy; Colonial ladder-back chairs; turned trestle table and Colonial hanging wall shelf; butterfly table; light Sheraton side chair; Hepplewhite rocker for a small child; Colonial mirror; early Georgian slant-top desk; Governor Winthrop secretary; Duncan Phyfe roll-top desk; spinet desk; Early American flat-top office desk; Chippendale wing chair; piecrust table; Sheraton-type grandfather's clock; William and Mary dressing table; mirror and stool; four-poster beds; Queen Anne highboy; Jacobean chest of drawers, and paneled cedar chests.

Fortunate the home craftsman who has the skill to tackle the projects in this book. With help from Franklin Gottshall he'll produce pieces of furniture for which his children's children will some day thank him.

Machine Woodworking
by Robert E. Smith
203 pages; illustrated;
McKnight and McKnight Publishing Co.,
Bloomington, Illinois; \$3.60.

THIS IS the third and newest edition of a book first published in 1938, revised ten years later, and now revised once more. In all it has had fifteen printings, evidence of its usefulness over the years. While written primarily as a text for manual arts students, it can be used with good results by the person with a home workshop who is just getting acquainted with power tools and also by the experienced woodworker who may want to check and see if he is getting all he can out of his power tools.

Professor Robert E. Smith has divided his book into twelve sections, each concerned with the operations

of a different power tool, except for the first section which deals with safety in the workshop.

To give an idea of how the material in Professor Smith's book is presented, here is what he tells his readers in the section on the circular saw: First he describes the saw, lists its parts, mentions the common varieties, tells how to adjust it, deals with its blades and guards, lists its uses and discusses its care. Then he tells the reader how to remove and mount blades, how to use the saw for ripping, how to set and use the saw for crosscutting, how to cut angles, how to cut a rabbet, a bevel, a groove, a dado or a groove, a gain, tenons, a molding, a tongue and groove joint and how to fit blades.

Professor Smith uses this same detailed approach in dealing with the radial arm saw, band and jig saws, the jointer, planers, mortising machines, bench shapers and routers, hand routers and such other electrically operated tools as electric drills and portable electric saw, power sanders, woodturning equipment and power and hand grinders.

One of the aspects of this book which adds to its usefulness is that not only does it explain to the reader just how to carry out all the basic operations possible with the various tools, but it also includes considerable information on the care and adjustment of those tools.

The House of Your Dreams
by W. A. Kirkpatrick
198 pages; illustrated; McGraw-Hill Book Co.,
New York City; \$5.50.

FOR MOST persons, one of the major decisions of their lives is their choice of a home. It's easy to make a bad choice and if you do you may suffer from it all of your life. But with a good basic body of information, it's just as easy to make a wise choice. A volume which will help you is "The House of Your Dreams," the purpose of which, in the words of its author, W. A. Kirkpatrick, is "to serve those people who wish to buy, build or remodel and who need to know more about property and houses in order to make such a large investment wisely. The book will also be useful to those who are constantly trying to improve their surroundings, making them more efficient, more economical, more suited to the changing family, more beautiful."

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a home you must decide whether to buy a house, remodel one or buy a lot and build on it. Professor Kirkpatrick, of the department of architecture at the University of Southern California, begins his book with a consideration of these possibilities, particularly as to the financial outlay involved in each. Once you have decided what you want to do, you are faced with the problem of choosing your new address. Professor Kirkpatrick offers good advice on what you should consider in making this choice. Then he gets even more specific and tells you how to go about choosing the plot of ground in the event that you have decided to build. A number of technicalities are involved in buying and financing a property and the author fills you in on them.

Every house can be divided into "use areas." The basic ones are the living, dining, service, sleeping, bathing, entrance and garage areas. These all bear a direct relationship to one another and Professor Kirkpatrick considers each of the areas and those relationships in chapters which round out the first part of his book. Included also is a chapter on outdoor living.

IN PART 2, called "Achieving the Right Environment" Professor Kirkpatrick takes up in detail such matters as using and enjoying the sun to the fullest extent (he even includes tables showing the sun angles for the United States in the various months of the year), insulation, temperature control, lighting, effective wiring, flooring materials and counter tops, controlling sound, color in the house and paints and natural finishes.

The book is copiously illustrated with photographs of a number of houses, drawings, and charts showing such things as electrical loads and circuits and the relative merits of various types of floor coverings, counter tops and the like.

Professor Kirkpatrick disclaims having had any intention to write a handbook. What he has done, he says, is to attempt to show why some ideas will work, why some won't, why some arrangements are more economical and efficient than others. He has sought to deal with basic principles which will remain constant with the passage of time rather than plugging for any one particular style of architecture, form of interior decoration or the like. Adding to the value of his book is the fact that he is aware that to most of us the matter of costs is all-important. He also knows that cost and value are not the same thing.

Pictorial Manual of Bookbinding
by Manly Banister
40 pages; illustrated; The Ronald Press,
New York City; \$3.75.

READERS OF many magazines, and we hope it is true of those who read this

one, often want to save back issues. The ideal way, of course, is to have the magazines bound by a professional, but this is costly, particularly if you have it done annually. There is no reason, however, why you shouldn't do the job yourself. The process is made clear in "Pictorial Manual of Bookbinding," which also tells you how to rebind books and bind manuscript pages into books.

Manly Banister has employed a minimum of text to tell you how bookbinding should be done. In fact, he much prefers to show you, rather than tell you, so he has included more than 200 photographs and drawings on the large pages that make up his book. Every step in the several methods of binding which he covers is clearly illustrated. Six styles of bookbinding are treated. The entire method of bookbinding is illustrated and discussed in the first style dealt with. After that, only new processes are described as the other styles are covered. For example, in the section dealing with style one, the operations of binding and backing are fully described and illustrated. These are not described and illustrated in the sections on other styles because the method of the procedure is the same. This tends to keep the book from being cluttered with repetitious detail.

After listing and describing the tools and materials needed, including a press, which you are told how to make yourself, Mr. Banister discusses such matters as how to tell which way the grain runs in paper (in bookbinding, all paper must be folded with the grain), book nomenclature and the preparation of glue and paste.

Then come the sections on the various styles of bookbinding. Style one is the lockstitch sewing method for sidestitched magazines (those stapled through the side at the back). Style two is for binding saddle-stitched magazines by sewing on tapes. Style three is a method for rebinding a book by sewing on cords. Style four involves the binding of a book of single manuscript sheets by the whipstitch method. Style five, rebinding a book with half-binding in leather with false bands and hollow back, is particularly useful if some book you treasure or have picked up second-hand has a binding that should be replaced. Style six involves a full leather binding achieved through flexible sewing.

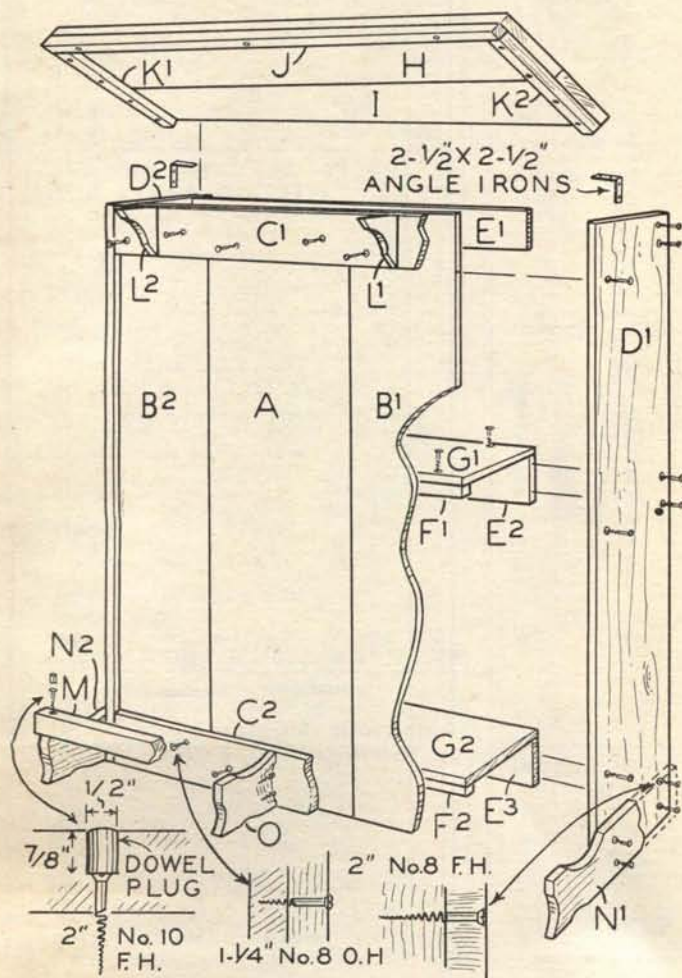
In a final section Mr. Banister tells you how to apply the finishing touches to your book by putting the title on the back, either by stamping it directly on the back or stamping it on a separate piece of bookcloth, leather or paper and pasting it on. He informs you how to make the tools needed for the stamping process. Finally Mr. Banister devotes a couple of pages to information on the preservation of leather bindings and the making of repairs to damaged books.



KNOTTY PINE BAR and stool have that much worn, old-tavern look.

Small Serving Bar with Matching Stool

ROBERTA L. FAIRALL



DETAILS of assembly for bar. Glue and brass screws are used throughout.

Sodas, sandwiches—whatever your guests prefer—can be made and served at this compact knotty pine bar.

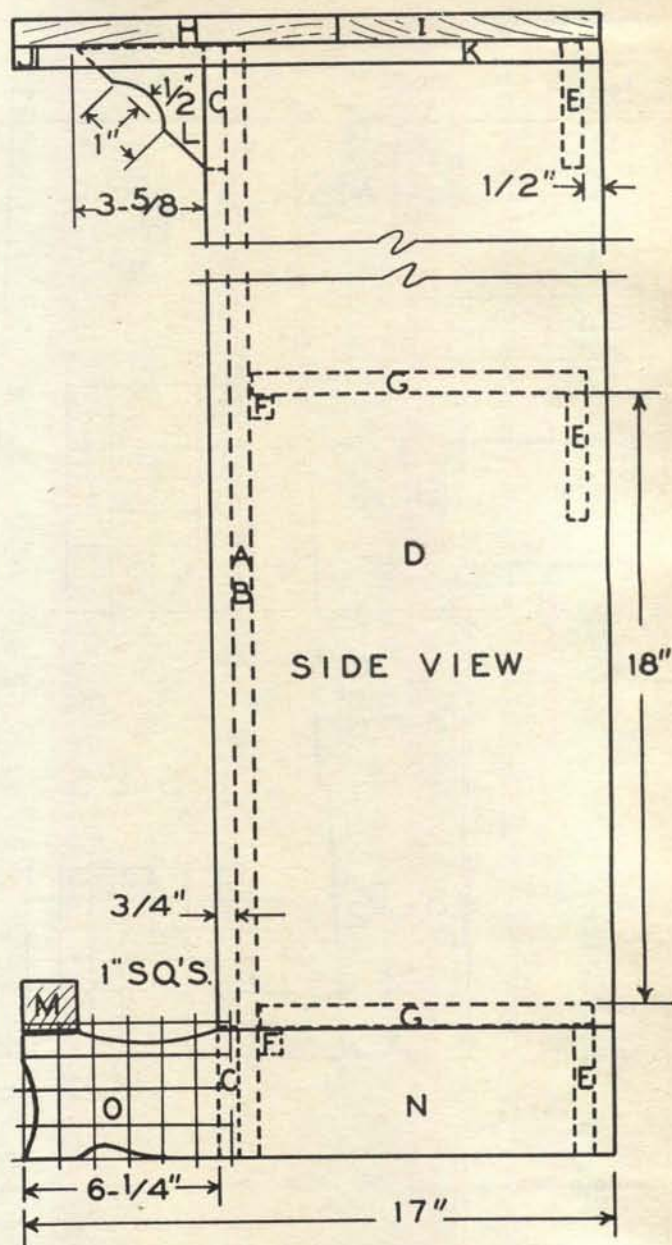
THIS LITTLE rustic bar and matching stool of knotty pine fit handsomely into den or dining room to help serve beverages and snacks. Simple hand tools can build it solidly without any cabinetmaker's fancy joints. Just follow a logical construction procedure.

With the exception of the footrail, which is 1 5/8 x 1 5/8" Douglas fir, the entire project is cut from 3/4" knotty pine lumber. Select only stock having small, tight knots, and take advantage of their pattern for decoration by laying pieces side by side, and checking their distribution before cutting. Enlarge full-size templates, on lightweight cardboard, for the curved outlines. Then, lay out members directly on the wood using dimensions given in the Materials List and illustrations. Be sure to allow at least 1/16" between members to give enough room for the saw cut and later sanding.

Complete the layouts by marking around templates to put in the curved lines. Next, saw out, and true up each piece. Locate, and mark positions of joining pieces on both sides of the lumber. Bore for screws. All joints are set in white plastic resin glue, and drawn together with brass screws. The trick is to start a couple of finishing nails in the piece before applying glue; then drive them in to prevent the joint from slipping while screws are turned in. If you wish, these small finishing nails may be left protruding, and removed after the glue has set, or the heads may be countersunk and covered with wood filler. They are hardly noticeable, but make construction go a lot easier. Heads of the brass screws are left showing.

MATERIALS LIST

Item	No. Rqd.	Description	Size
BAR			
A	1	Front (center)	$\frac{3}{4}$ x $11\frac{1}{2}$ x $39\frac{1}{4}$ "
B	2	Front (side boards)	$\frac{3}{4}$ x $7\frac{1}{2}$ x $39\frac{1}{4}$ "
C	2	Cleats for front	$\frac{3}{4}$ x $3\frac{5}{8}$ x $26\frac{1}{2}$ "
D	2	Sides	$\frac{3}{4}$ x $11\frac{1}{2}$ x $39\frac{1}{4}$ "
E	3	Stretchers	$\frac{3}{4}$ x $3\frac{5}{8}$ x $26\frac{1}{2}$ "
F	2	Shelf cleats	$\frac{3}{4}$ x $\frac{3}{4}$ x $26\frac{1}{2}$ "
G	2	Shelves	$\frac{3}{4}$ x $9\frac{1}{2}$ x $26\frac{1}{2}$ "
H	1	Top (front section)	$\frac{3}{4}$ x $9\frac{1}{2}$ x 36 "
I	1	Top (rear section)	$\frac{3}{4}$ x $7\frac{1}{2}$ x 36 "
J	1	Top cleat (front)	$\frac{3}{4}$ x $\frac{3}{4}$ x 36 "
K	2	Top cleats (side)	$\frac{3}{4}$ x $\frac{3}{4}$ x $16\frac{1}{4}$ "
L	2	Brackets for top	$\frac{3}{4}$ x $3\frac{5}{8}$ x $3\frac{5}{8}$ "
M	1	Footrail	$1\frac{5}{8}$ x $1\frac{5}{8}$ x 31 "
N	2	Side supports for footrail	$\frac{3}{4}$ x $3\frac{5}{8}$ x 17 "
O	1	Center support for footrail	$\frac{3}{4}$ x $3\frac{5}{8}$ x $6\frac{1}{4}$ "
STOOL			
P	1	Seat	$\frac{3}{4}$ x $11\frac{1}{2}$ x $11\frac{1}{2}$ "
Q	1	Sub top	$\frac{3}{4}$ x $7\frac{3}{32}$ x $7\frac{3}{32}$ "
R	2	Sides	$\frac{3}{4}$ x $11\frac{1}{2}$ x $29\frac{1}{4}$ "
S	2	Front and Back	$\frac{3}{4}$ x $7\frac{1}{2}$ x $7\frac{3}{4}$ "
T	2	Stretchers	$\frac{3}{4}$ x $3\frac{5}{8}$ x $11\frac{1}{2}$ "



SIDE VIEW PLAN for bar shows pattern for footrail supports and positions of shelves.

STEP-BY-STEP assembly of the bar follows:

1. Edge-glue, and cleat the top, H-I, using $\frac{1}{4}$ " flat-head screws. Join shelves, G, to stretchers E-2-3 with flathead screws.

2. Position the center support for footrail, O, and join to cleat C-2 with flathead screws. Locate brackets, L, $3\frac{1}{2}$ " from the ends of front cleat C-1, and countersink flathead screws through the back.

3. Edge-glue front pieces, A-B; join shelf cleats, F, to the backs; then front cleats, C-1-2, flush at top and bottom.

4. Join sides, D, to front, flush with front edge of cleats C, using 2" oval-head screws. Position stretcher E-1 and shelves; then turn screws through sides into stretchers. Be sure to use countersunk flathead screws for lower stretcher, E-3, since the footrail support must cover them. Turn $\frac{1}{4}$ " flathead screws through shelves into cleats F.

5. Join supports for the footrail to sides with $\frac{1}{4}$ " oval-head screws. Position footrail with screws counter-bored and plugged.

6. Position top flush at back, and drive flathead

screws down into sides and front. Drive screws through brackets, L, into top.

ASSEMBLY STEPS for the stool:

1. Join sub-top, Q, to seat, P.

2. Assemble sides, R, with front and back, S, using 2" oval-head screws; then set stretchers, T, in their mortises. Filing inside edges of leg mortises slightly will compensate for slant of sides. Level top edges of sides, front and back.

3. Place seat in position, and turn screws through sides into sub-top. Brace with angle irons.

Give the bar and stool a well-worn look by cutting away sharp edges unevenly with a wood rasp. Then, prepare for the finish by sanding until the grain shows clearly. Brush on a light brown stain, and wipe away the excess, especially the highlighted edges, with a clean cloth. Let dry, and give a filler coat of thinned-down spar varnish. Finish with two coats of spar varnish buffed with very fine steel wool between coats, and also after the final coat. This removes an undesirable shine; then you can bring up and retain a soft luster with paste wax.

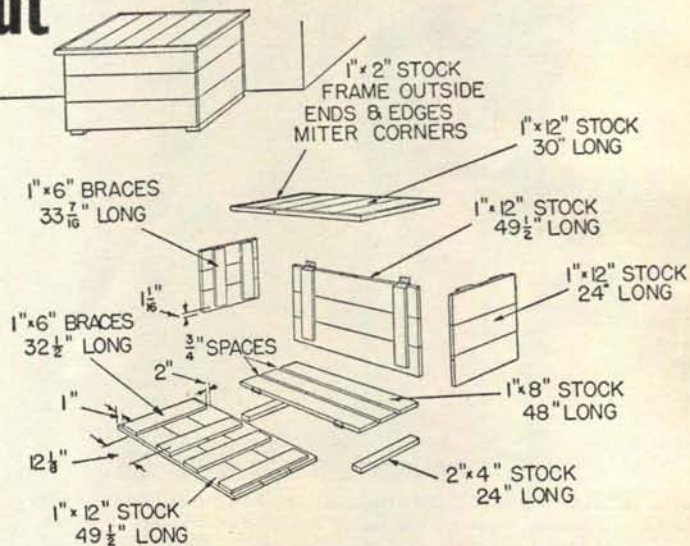
Put your trash can out of sight

UNSIGHTLY TRASH cans and garbage cans can be hidden away and protected from dogs and flies with a sturdy container. The hide-away can be made with hand tools and stock lumber, and painted to harmonize with existing buildings or vegetation.

The base is made of three pieces of 1-by 8-inch lumber, spaced $\frac{3}{4}$ inch apart and nailed to two 24-inch lengths of 2-by-4-inch lumber. Use 8-penny finishing nails.

The sides, and front, are made of 1-by-12-inch lumber, cleated together with 1-by-6-inch braces. The back is of 1-by-12-inch lumber cleated with 2-by-4-inch lumber. The 2-by-4's also serve as footings for the top hinges.

The top, of 1-by-12-inch lumber, is edged-glued, and then nailed and glued into a mitered frame of 1-by-2-inch lumber. The 30-inch depth of



the top allows for an overhang in the front which serves also as hand-hold for raising the top.

Assemble by nailing the base and back to the sides. Attach 3-inch butt hinges to the back and base, as shown. A pair of latches will be

needed to hold the front in place; the top needs no latch.

Trash boxes or cans are easily accessible for filling when the top is raised. Heavy filled boxes or cans can be easily removed by opening both the top and the front.

Room Divider that's Louvered

A ROOM divider which can be adjusted to allow air circulation may be made in louvered design. Length and height will vary with the space to be enclosed.

First make the floor plate and the corresponding member to hold the upper ends of the louvers. Care should be taken to assure that the

holes in the two members match, and that the dowel holes are centered in the ends of the louvers.

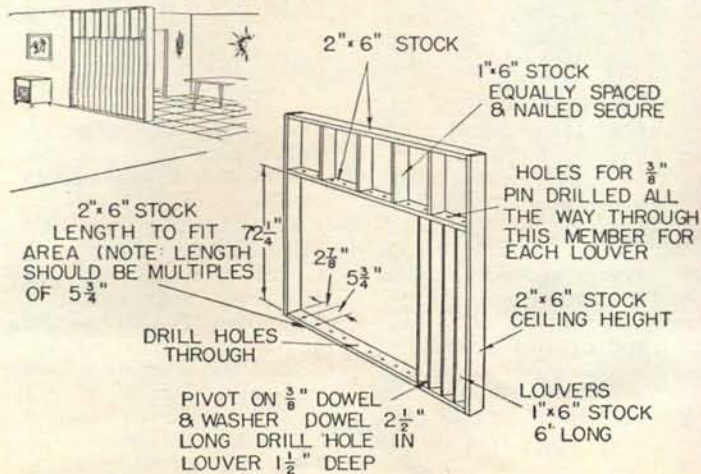
If one end of the divider is to be fastened to a wall, as shown, the divider should be constructed as follows: First, make the upper portion, assembling the 2-by-6-inch ceiling plate, 1-by-6-inch separators and

the 2-by-6-inch louver rail, nailing through the 2-by-6-inch members into the 1-by-6-inch separators. Then fasten this assembly to the two upright 2-by-6-inch members, nailing from the outside of the uprights. This is a two-man job, one man holding the upper assembly against the ceiling while the other adds the upright members; the end of the divider at this point in the construction is not yet against the wall. When the uprights are firmly fastened to the upper assembly, slide the partly completed divider against the wall, and secure it to the wall and ceiling.

Next insert the dowel pins into the bottoms of the louvers, with 1 inch of each dowel extended. Stand the louvers in place in the floor plate. Slide the plate and louvers into the frame, and place a dowel pin through the upper frame member into each louver. Then nail the floor plate to the floor, and to the base of the uprights.

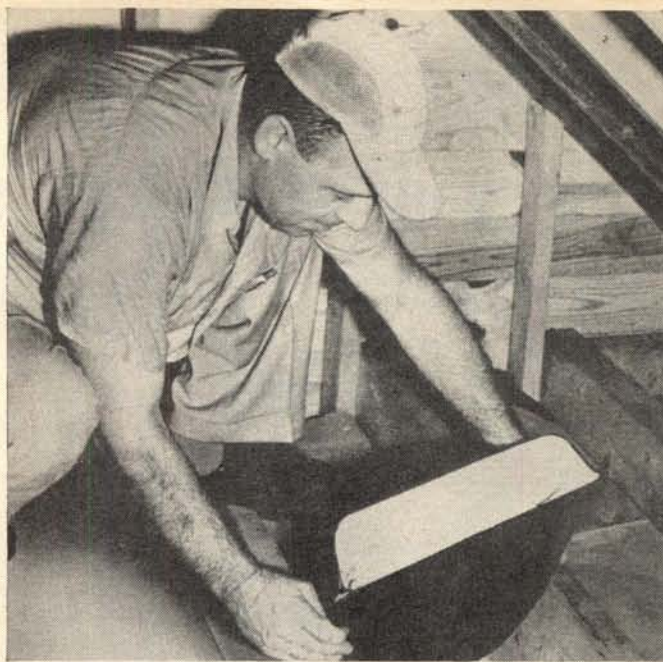
Use 10-penny finishing nails to assemble the divider. Special nails or fasteners may be needed for the tie to the wall and to the ceiling.

Sand the divider smooth and round all sharp edges before finishing with a clear varnish to emphasize the grain of the wood.





WHEN INSULATING ATTIC CEILINGS, insert rock wool batts snugly between beams with vapor barrier facing down. Fasten flanges to beams with nails or staples no more than six inches apart. Sidewall insulation should extend no higher than ceiling beams in order to leave sufficient space between attic ceiling and peak of roof for ventilation.



WHEN INSULATING ATTIC FLOORS (over heated space), insert rock wool batts (rock wool encased in jackets) snugly between rafters over finished ceiling with flanges folded back. No fastening is necessary. Vapor barrier (extra thick) side of batt faces down.

Some Facts About Home Insulation

An expert in the field tells you why he thinks proper insulation is so important for comfortable and economical living.



WHEN INSULATING ATTIC SIDEWALLS proceed from floor to ceiling beams. Insert rock wool batts snugly between studs with vapor barrier facing indoors. Fasten flanges to studs with nails or staples no more than six inches apart. Where water pipes are encountered, rock wool must be wedged behind pipes for proper insulation. If batt does not fit exactly in area to be insulated, cut with shears to exact size but leave vapor barrier overlapping for fastening.

THERE IS nothing mysterious about insulation. It can be described simply as a wall between warm air and cold air. Scientists tell us that air always moves from warm to cold. Therefore, the better job a wall does of slowing down this movement of warm air, the better insulation it gives.

Applying these facts to your home, you'll find that insulation works in two ways. In the winter, the heated air in your home tries to escape to the outside air through the floors, walls and ceilings. In the summer, the warmer outdoor air tries to enter your home the same way.

Unfortunately, stone, brick, concrete and plaster—materials used in home construction—are relatively poor insulators because they are porous and air passes through them easily. Rock wool, on the other hand, is made up of millions of dead air cells which effectively prevent heat from entering or leaving your home.

A section of rock wool four inches thick, for example, has the insulation effect of 125 inches of stone, 120 inches of concrete, 70 inches of brick or 15 inches of wood. By lining ceilings and walls with a sufficient thickness of rock wool, you can make your house much more comfortable in both winter and summer, and bring about considerable savings in both fuel and air conditioning costs.

For instance, let's look at the results of a survey by two University of Illinois researchers on how much was saved by insulating a five-room ranch home with four inches of rock wool in the ceiling and three inches in the walls.

SHELDON CADY

Immediate savings were obtained in the installation of a home air conditioner because the insulated homes needed only a two-ton unit compared to the six-ton unit required by the same home without insulation. Savings: between \$700 and \$900, depending on the make.

Savings on cooling costs in the insulated homes ranged from \$258 a year in Jacksonville, Florida, to \$116 a year in St. Louis, to \$50 a year in New York City.

During the winter, the same homes showed savings in fuel bills ranging from \$24 a year in Jacksonville to \$95 a year in St. Louis and \$110 in New York.

How much did it cost to insulate these houses? Approximately \$240.

Of course, the cost of insulation will vary, depending on the size and needs of your home. Insulation costs less when it is installed while the home is being built, but old home or new home, proper insulation pays off in savings and comfort.

THE HOMEOWNER or prospective home buyer may well ask if most homes are built with the proper amount of insulation. The answer is: not usually.

Experts advise six inches of ceiling insulation or its equivalent and three inches of insulation in the walls of a home. Most homes built before World War II had no insulation at all, and postwar homes vary. Some have a few inches of rock wool in the ceiling only. Others have none at all. If you are buying a home, it will pay to check to determine if there is sufficient insulation.



WHEN INSULATING SLOPING ATTIC SIDEWALLS, proceed from floor to ceiling beams. Insert rock wool batts snugly between rafters with vapor barrier facing indoors. Fasten flanges to rafters with nails or staples no more than six inches apart. Fastening may be done inside rafters if finishing materials are to be placed over insulation. Where vapor barrier is torn during installation or rock wool exposed, tape surplus vapor barrier material over exposed area.

In existing homes, insulation needs will differ. If your house has a heated basement, only ceilings and walls need be insulated. Where the attic is uninhabited, the insulation should be placed in the attic floor. Where the attic is lived in, the insulation should be placed in the attic ceiling and extended up the attic walls from the walls of the rooms below.

If your house is built over a crawl space, the sides of the "crawl" should be covered with insulation board and the ground covered with a good grade of roofing felt. Openings leading into the house, such as around plumbing, should be filled with insulating material.

If your house is built on a concrete slab, there should be a belt of insulation around the outside edge of the slab and, if possible, between the slab and the footing wall.

Added insulation can be obtained by weather-stripping doors and window sills, by using awnings or jalousies in the summer, by installing storm windows or storm doors or using insulating glass. If your house has a built-in garage, it too should be insulated. The ceilings of open porches should be insulated if there is living area overhead.

There are other products besides rock wool that help insulate a house. These include wood fiber board such as insulating sheathing which is applied to the wood framework of a new home. Insulating board and planks and insulating ceiling tiles are used to finish attics and playrooms.

Once you decide to insulate and call in a local contractor, make sure you know exactly what his estimate covers, what material he will use, its thickness and brand name. It will pay to get more than one estimate,

but don't be guided solely by price: a contractor whose reputation for workmanship is well-known may be preferred even though his price is somewhat higher than a competitor.

What about do-it-yourself possibilities? They range from fair to good, depending on how handy you are and how much tearing apart and putting together must be done.

Where existing walls require insulation, wallboards, siding shingles or bricks have to be removed to enable a hose to be inserted and granulated rock wool blown in. In such instances an experienced con-

tractor should be called.

In an attic, however, where floors and walls are exposed, the do-it-yourselfer will find plenty that he is able to do. Here rock wool batts are ideal. A batt is rock wool wrapped in a blanket of paper or foil. The batt is designed to fit snugly between studs or rafters. Two flanges on each side enable the homeowner to nail or staple it securely to the stud.

Before you go ahead with an insulation job, check with your building supply dealer as to the amount of material you will need. Make sure you understand the need for putting the "vapor barrier" side of the batt always facing the direction of winter heat to keep indoor moisture from entering the construction. Make sure also that your attic is properly ventilated above the insulation so that moist warm air will not build up and stagnate under the roof.

WHILE SAVINGS and comfort are reason enough for considering insulation, there are other advantages too.

Rock wool, for instance, gives excellent fire protection. Underwriters report numerous instances of lives saved and reduced home damage thanks to its fire-retardant qualities.

Insulation behind walls and ceilings also keeps them cleaner longer. The accumulation of dirt "shadows" is slowed so as to delay substantially the time needed for repainting or redecorating.

All in all, insulation is quite a bargain. For the homeowner, it should be high on his list of needed improvements. For the new home buyer from Florida to Maine, insulation is a must.

Sheldon Cady, author of the foregoing article, is supervisor, insulation products, for the Barrett Division, Allied Chemical Corporation.



WHEN INSULATING ATTIC FLOORS (over unheated space), insert rock wool batts snugly between rafters with vapor barrier facing up. Fasten flanges to rafters with nails or staples no more than six inches apart.

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Making Paint Removal Easier

C. JOE THOMAS

REMOVING PAINT and varnish is a job most people dread. Despite the excellence of many liquid removers,

using them is often an untidy sort of a task. The following procedure will eliminate much of the messiness, speed up the work and improve the disposition of the worker.

Obtain a vessel of warm water in which a sprinkling of laundry detergent has been dissolved. Beside this set a pie pan or any flat container, in which a quantity of dry detergent has been placed. A steel or nickel sponge, of the type used to scour pots and pans, will be needed. Steel wool will work but the metallic sponge is the best.

Select an area of convenient size on the surface to be removed and brush on a liberal coat of paint remover. The time required to soften the old finish will vary with different surfaces and a little experimentation will determine the necessary softening time.

Dip the sponge into the water, then into the dry detergent and rub the prepared surface with it. As the sponge fills, it will be necessary to repeat the process.

The detergent on the sponge helps the scouring action and causes the softened material to dissolve in the water. When the sponge is returned to the water, rinsed and squeezed out, it will be clean each time.

WHEN YOU have loosened and removed all that has been softened, dip a coarse rag in the water and wash off the residue. After another quick wiping, with a rag moistened in clear water, your wood is clean. Then select another area of reasonable size and proceed as before, until your object is cleaned.

The sponge will effectively clean most surfaces; however, you may encounter coves, carvings, etc., that it will not reach. Here a stiff bristled brush will be found helpful, as well as a pocketknife now and then.

When the old finish is very thick, you will need to repeat this process, as paint remover will penetrate only so far in one application.

The above method requires less remover, has a desired bleaching effect on the wood and results in happier working conditions because the worker does not have to cope with usual sticky mess.



Nancy Hutchings creates nature panels-and
YOU CAN DO IT TOO.



This fine Bermuda artist is widely known for her lovely and highly original glass panel designs. She uses materials indigenous to the Island . . . ferns, bay grapes, bamboo, sea fans, shells, star fish, butterflies and many others.

You, too, can make your own screens, room dividers, door panels, lamp bases, place mats, dishes, coasters and many other decorative articles for your own home or for special gifts. Your own region abounds with native materials that will lend themselves beautifully to this fascinating new craft.

The laminating process is so simple anybody can do it. Neither heat nor pressure are required nor is any equipment needed except a pair of scissors and a set of measuring spoons. And it is surprisingly inexpensive.

We'll be delighted to mail you illustrated directions which show you how Nancy Hutchings creates these enchanting screens. Write to Dept. M-9, The Castolite Co., Woodstock, Ill. Please enclose 25c to cover our cost.

THE CASTOLITE CO., Woodstock, Ill.





With Santa Claus in His Workshop

How To Make:

A BLACKBOARD AND TRAIN TABLE
A DECORATIVE CHRISTMAS WHEEL
A ROLL OUT DRAWING BOARD
A SWAN SLEIGH

A TOY HAND DRILL
A PHOTOGRAPHER'S
DARKROOM CABINET
A TOY TELEVISION CAMERA

SIMPLE WAYS TO HANG CHRISTMAS DECORATIONS

This piece of furniture keeps the youngsters entertained two ways. On one side it's a blackboard, on the other a table for an electric train with track attached.

Roll Away Blackboard and Train Table

RALPH G. SMITH, JR.

IN THESE days of larger families and more compact houses, space is often a problem. This combination blackboard and train-table helps solve the problem in two ways—it does double-duty, and it is easy to move, clean around and store.

Standing upright, it is a blackboard large enough to allow three or four children to give full rein to their artistic urges. With the folding legs in place and tipped to form a table, it is perfect for that electric train that your young engineer has to set up on the living room rug and take down when company comes or when mother gets tired of tripping over it. The track is fastened permanently

to the table, so it is ready for play in a jiffy. If there is not sufficient floor space in Junior's room to accommodate the table when in "train position," it can be first rolled out to the family room or porch, and rolled back when play time is over.

As for construction, the blackboard-train-table is a simple and rapid job which you can do with ordinary hand tools and standard stock lumber and plywood.

The table itself is a piece of $\frac{1}{2}$ -inch plywood. The board shown in the illustrations is 4 feet by 6 feet. The size can, of course, be varied to suit individual requirements. You should be certain that it will accommodate

the train track layout you desire, however. The plywood should be fairly smooth on both sides. "AB" or "AC" grade should do the job well. Use the smoother side for the blackboard.

The lumberyard where you buy the plywood will cut it to size at little or no cost.

The edging of the board is standard 1-by-2 inch stock.

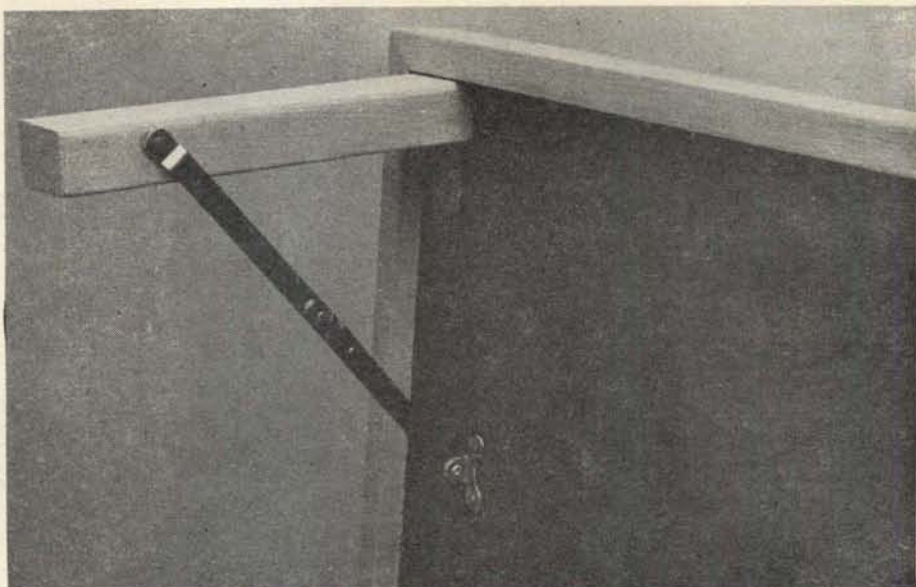
First, cut the top and two side edge strips carefully to fit, as shown in Figure 1. Leave the bottom edge for later. Attach the top and side edge strips to the board with finishing nails and glue. White glue is very satisfactory for this purpose.



THE BLACKBOARD SIDE of the combination is big enough to let the whole family get into the act.

Next, cut the two bottom supports from 2-by-4 stock. Each of these pieces is 16 inches long. Cut the triangular braces from a short piece of 2-by-6 stock, to the dimensions shown in Figure 2. The grain should run parallel to the hypotenuse of the triangle. Care should be taken to get the angles exactly square so that the board will stand straight upright.

Attach these triangular braces to the 2-by-4's previously cut, using long nails or 2 $\frac{3}{4}$ -inch screws, and glue. When the brace assemblies are completed, carefully position the board on the brace assemblies, according to the measurements shown. It is best to do this by placing the brace assemblies on the floor, having a helper hold the board upright and in position. Now drill pilot holes for the screws and place 2-inch screws through the board and into the tri-



DETAIL OF FOLDING LEG, showing placement of hinge and card table type bracket or brace.

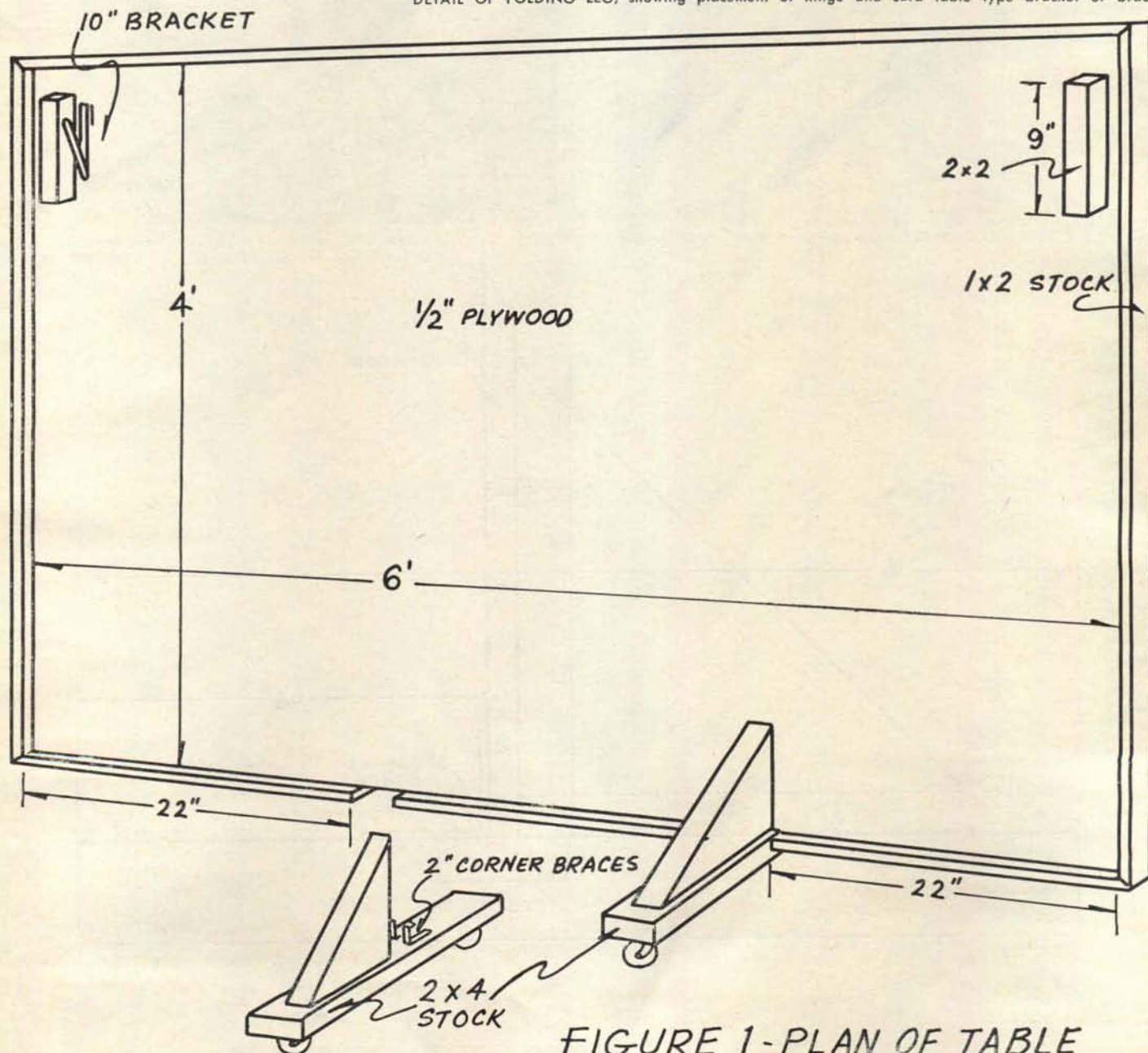


FIGURE 1-PLAN OF TABLE

angular braces of the brace assembly, using glue as before. Two 2-inch metal angle braces are now screwed tight to the train side of the board on each brace assembly. Use ½-inch screws for this purpose so that they will not show through on the other side of the board.

Now cut the bottom edging material to fit, and attach with finishing nails and glue as before.

THE BOARD itself is now complete, and casters are attached. Drill a ¼-inch hole 1 inch from each end of each

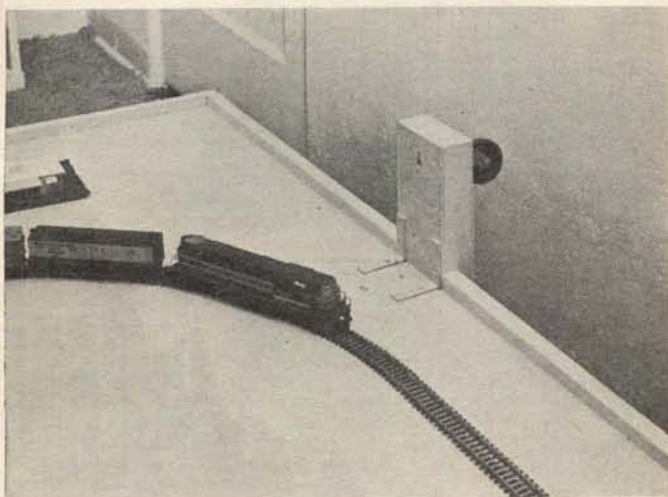
2-by-4 of each brace assembly. Insert the caster sleeves, pounding them in firmly. Two-inch casters of the ball-bearing type should be used for easy rolling.

Next step in construction is to paint the blackboard side (the side to which the triangular braces are attached) with special blackboard paint, following the directions on the can carefully. When the blackboard has dried, paint the remaining trim and the train side of the board.

The folding legs are made of 2-by-2-inch stock, each 9 inches long. They

are attached to the board with small hinges as shown in the photograph. Braces are the card table type, 10-inch size, available at any hardware store. Be sure to get one "right" and one "left," as they are not the same.

The last step is to assemble the train track and attach it to the train side of the board. The HO gauge track shown has holes provided in each track section for that purpose. Half-inch wire brads were used. If desired, light model scenery, houses, tunnels and the like can be attached permanently to the board with glue.



DETAIL OF THE BRACE ASSEMBLY, showing use of metal corner braces.



WHEN USED as a train table, the board provides plenty of train-room and foot-room, too.

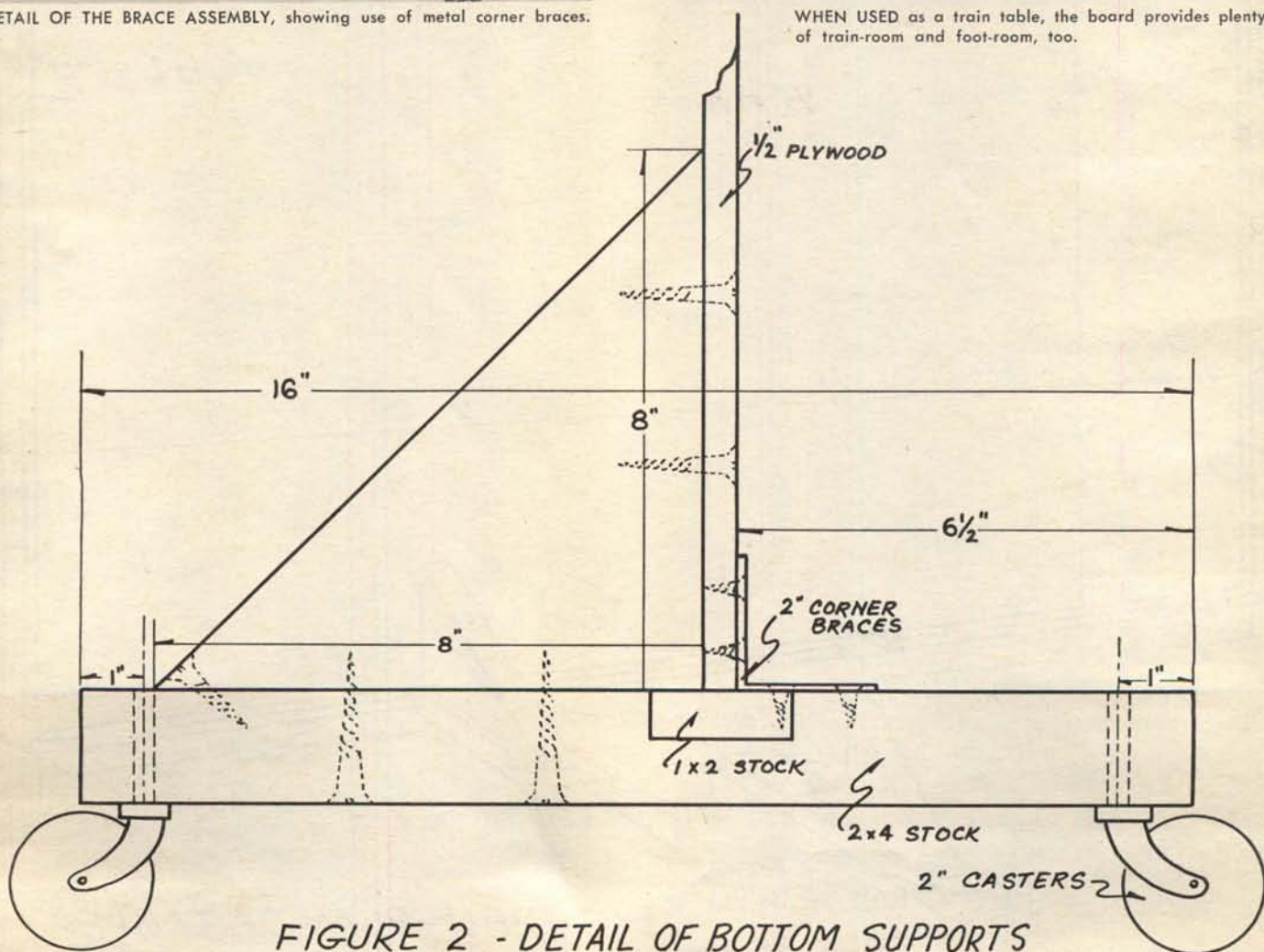
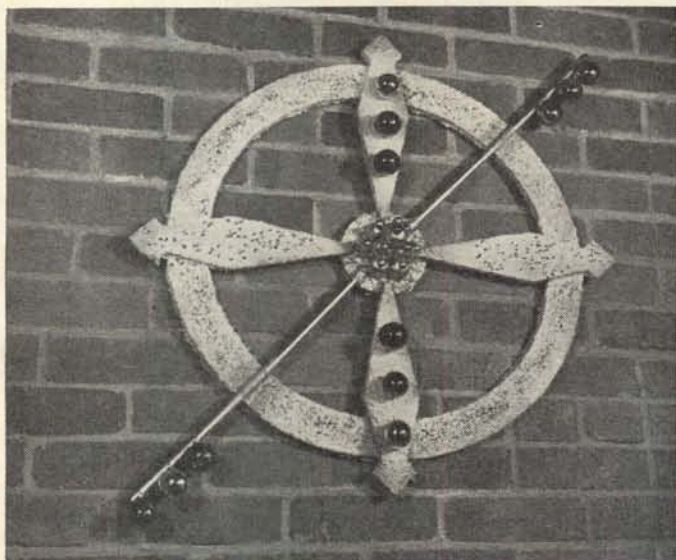
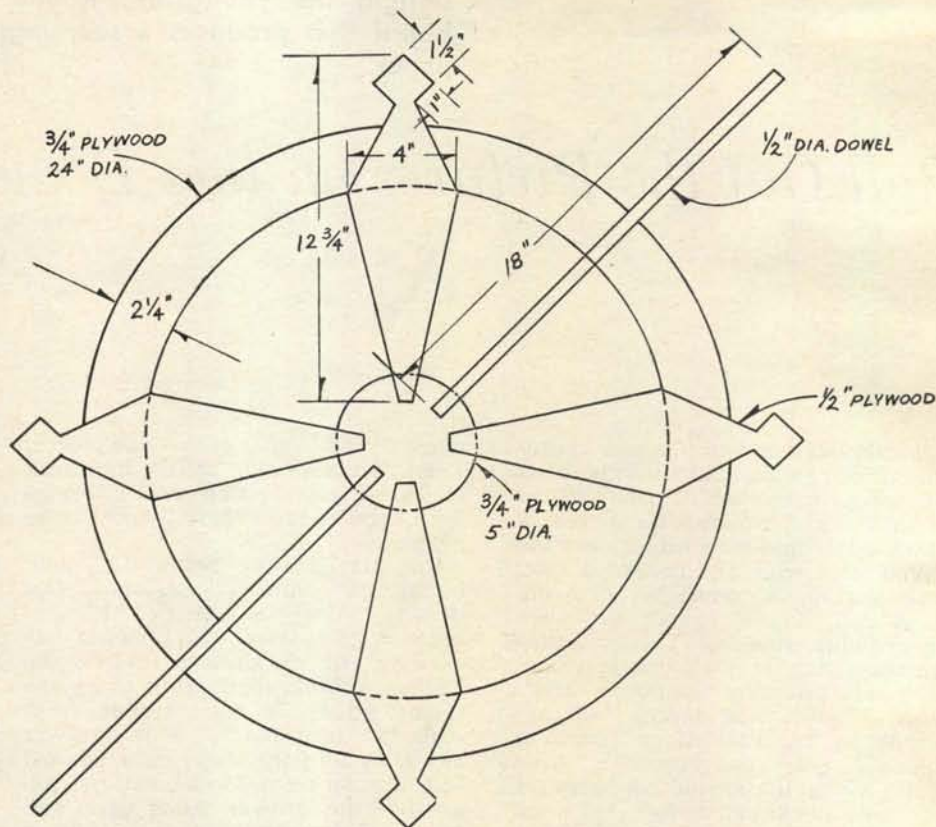


FIGURE 2 - DETAIL OF BOTTOM SUPPORTS

Decorative Christmas Wheel

R. J. DeCRISTOFORO



THIS CHRISTMAS WHEEL is made of plywood covered with papier-mache' and decorated with "snow," sequins and glitter. Large balls are Christmas tree ornaments; center is a mound of cotton snowballs.

CENTURIES AGO in Germany, the pagans started the custom of the fire-wheel. Today, transformed, and absorbed into the traditions of our own Christmas, it becomes the wreath, or the decorative circle with which to adorn a door or fireplace wall.

We made one to last through the years. The wooden parts are plywood cut out on a jig saw, or by hand with a coping or keyhole saw. And you don't have to worry about smoothing down edges for a papier-mache' coating takes care of that.

After plywood parts are cut, assemble them with glue and small nails, as shown in the drawing. You may have to drill small holes through the dowel so you can drive nails through it easily.

Make papier-mache' by shredding newspaper and stir-

ring in water until you have a pulpy mass. Make enough to fill a quart-size bowl but don't use too much water; just enough for a workable mix. Add a cup of flour gradually, mixing continuously. Add more flour if mixture is too moist.

Spoon the papier-mache' onto the plywood base over all surfaces and edges; don't smooth it. Put aside to dry.

The center is a mound of cotton snowballs attached with glue or some mastic.

Spray generously with Christmas "snow" and while snow is wet, decorate with sequins and glitter. Gold paint can be used on the dowel and the snowballs. To hang Christmas tree ornaments drive in small finishing nails and bend the heads into a hook shape.

A picture frame hook on the back of the wheel can be used to hang it.

THE END



PAPIER-MACHE' should not be too wet. Apply with spoon or small spatula to all areas. Rough surface is more effective than smooth ones.

Delight the youngster on your Christmas list with a drawing board that produces a seemingly endless supply of fresh white paper.

Roll Out the Pictures on this Drawing Board

ELMA WALTNER

IF JUNIOR likes to draw he will appreciate this drawing board that is fitted with a continuous roll of paper. When a picture is completed the paper is drawn down and torn off against the crayon stick edge and presto! a new, clean surface is ready for drawing on. A roll of shelf paper furnishes the drawing surface. There is also a drawer for crayons, pencils and other necessities for the young artist.

Cut the two side pieces "A" according to the dimensions shown in Figure 2. Sides are cut of $\frac{3}{4}$ " pine stock. Along the inside top edge of each side piece cut a dado $\frac{1}{2}$ " deep and $\frac{1}{4}$ " wide. See view, Figure 1 for the front view which shows the assembly. The top piece fits into the dado cuts on the side pieces for a neat top appearance.

Cut the cross sticks "B" and drawer slides "C" of $\frac{3}{4}$ " stock according to dimensions shown above Figure 1. Fasten drawer slides in

place on the insides of the side pieces. Then assemble side pieces and cross sticks using wood screws. For assembly diagram see Figure 2 and Photograph A.

Cut the drawer front "E" and handle "G" from $\frac{3}{4}$ " pine stock. Cut drawer sides "H", back "I" and bottom "F" from $\frac{1}{4}$ " plywood according to dimensions shown on Figure 3. Make dado cuts along the inside edges of the drawer front ends $\frac{1}{2}$ " deep and $\frac{1}{4}$ " wide. Drawer sides fit into the dado cuts against the drawer front for a neat fit. Assemble the drawer using glue and brads. Note that the drawer front is wider than the sides and back. Set on the sides and back pieces so the top edges are flush with the top edge of the front, the bottom edge of the front extending beyond the rest of the drawer assembly. This extension acts as a drawer stop when it strikes the front crosspiece of the frame.

See Figure 3 for drawer assembly detail. Photograph B shows the drawer being fitted to the frame for checking fit before putting on frame top.

Fit the top in place after spreading glue along the dado cuts of the top sides (Photograph C). Note that the sides extend beyond the back edge of the top piece. The front edge of the top piece is set flush with the front edges of the side pieces.

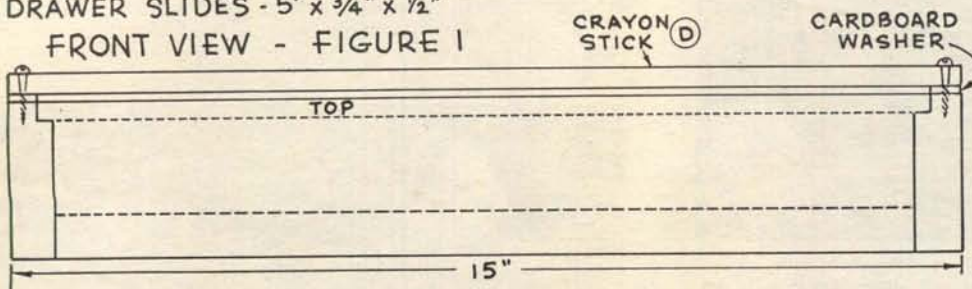
Cut the crayon stick "D" of $\frac{3}{4}$ " pine stock. Cut a shallow dado groove in the top. Dimensions are shown above Figure 1.

Attach the crayon stick to the front ends of the side piece tops with round-head nickel screws. Place a cardboard washer between the sides and the crayon stick (Photograph D). This allows the paper to be slipped between the top and the crayon stick.

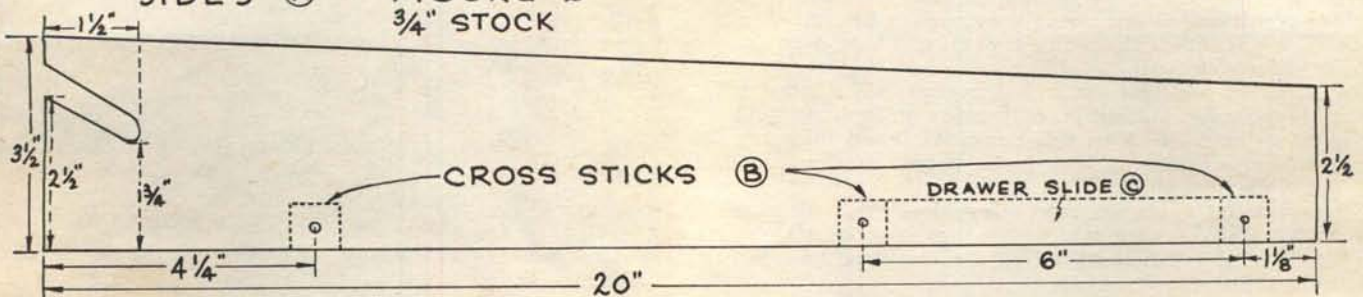
For the roller axle for the roll of shelf paper cut two circles of $\frac{3}{4}$ "

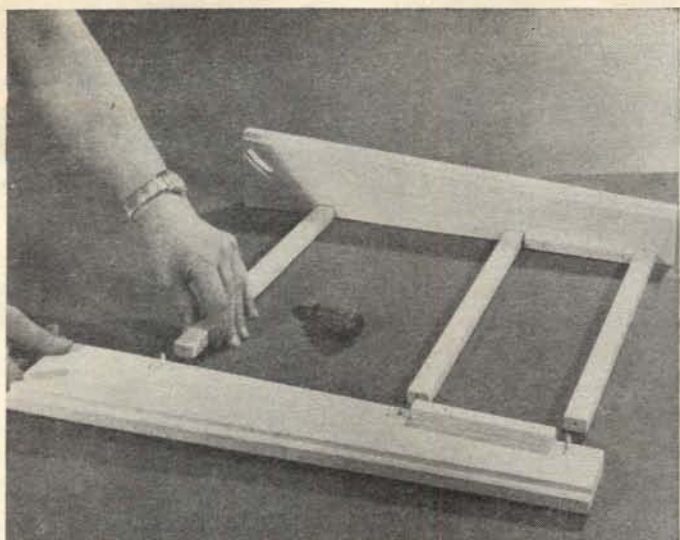
TOP - 14" x 18" x $\frac{1}{4}$ " PLYWOOD
CRAYON STICK - 15" x 1" x $\frac{3}{8}$ ", with $\frac{1}{8}$ " deep dado to hold crayons
CROSS STICKS - 13 $\frac{1}{2}$ " x $\frac{3}{4}$ " x $\frac{3}{4}$ "
DRAWER SLIDES - 5" x $\frac{3}{4}$ " x $\frac{1}{2}$ "

FRONT VIEW - FIGURE 1

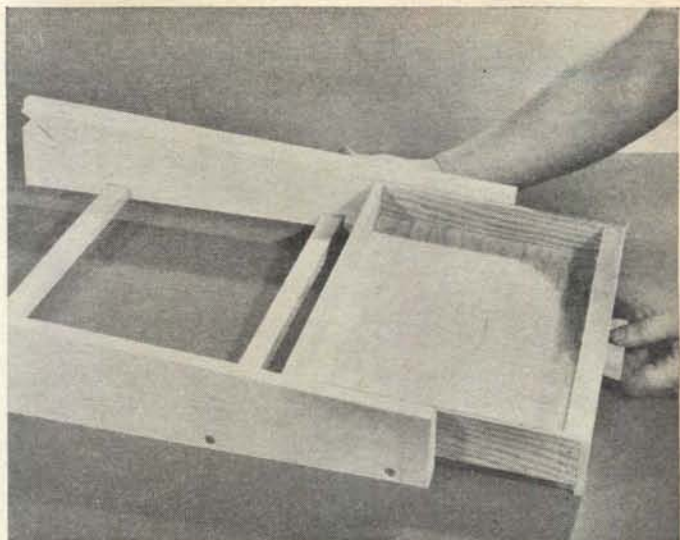


SIDES (A) - FIGURE 2
 $\frac{3}{4}$ " STOCK

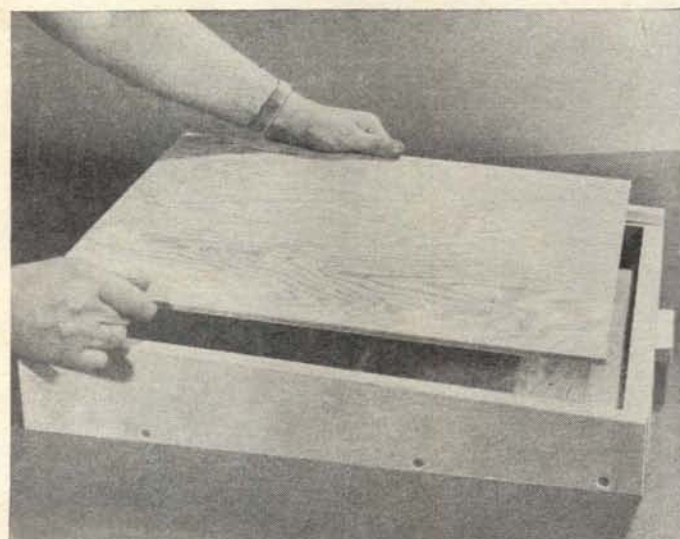




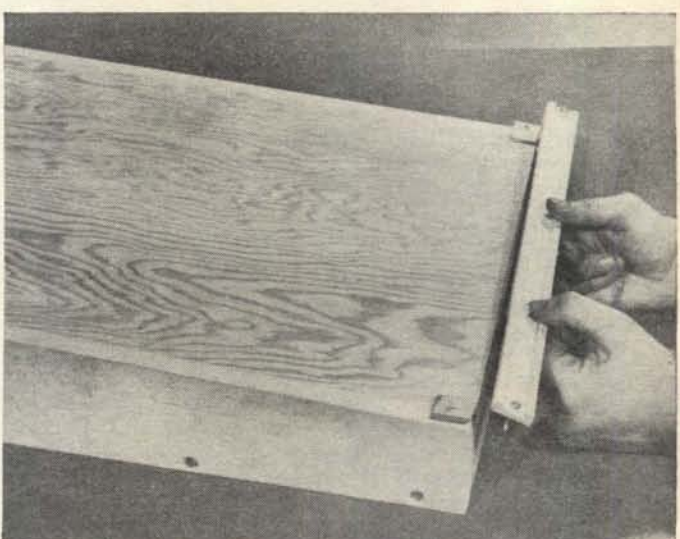
PHOTOGRAPH A—Assemble the side pieces and cross sticks, using wood screws. The flatheads of the screws should be countersunk into the outsides of the side pieces so the heads are flush with the surface of the wood.



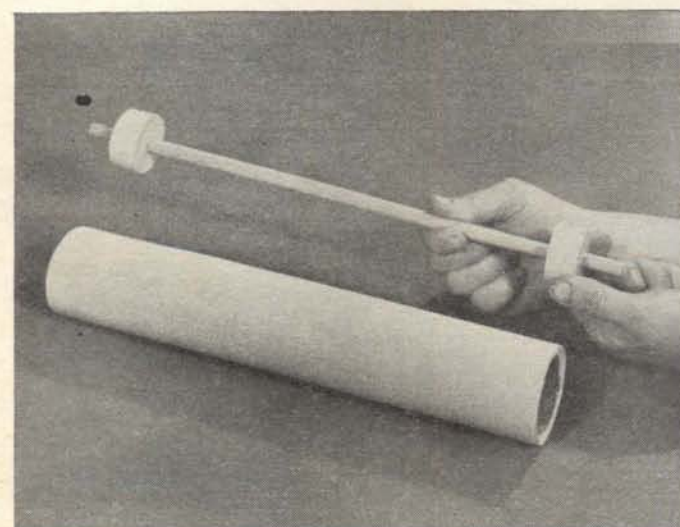
PHOTOGRAPH B—Assemble the drawer and fit into place.



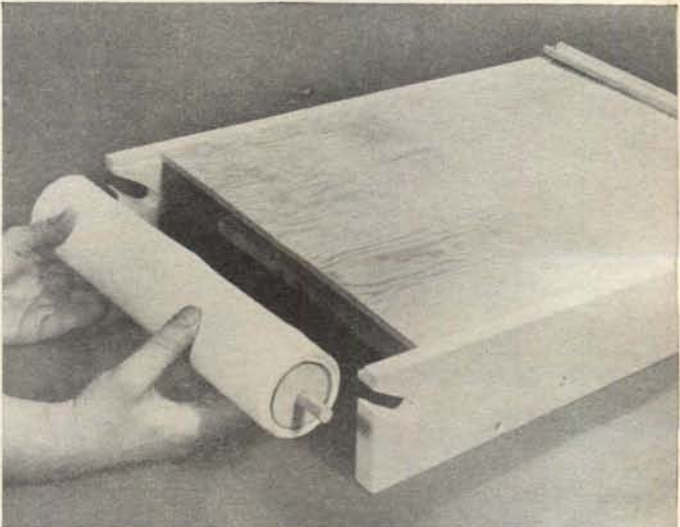
PHOTOGRAPH C—Fit the top into the dado cuts in the side pieces. Glue in place.



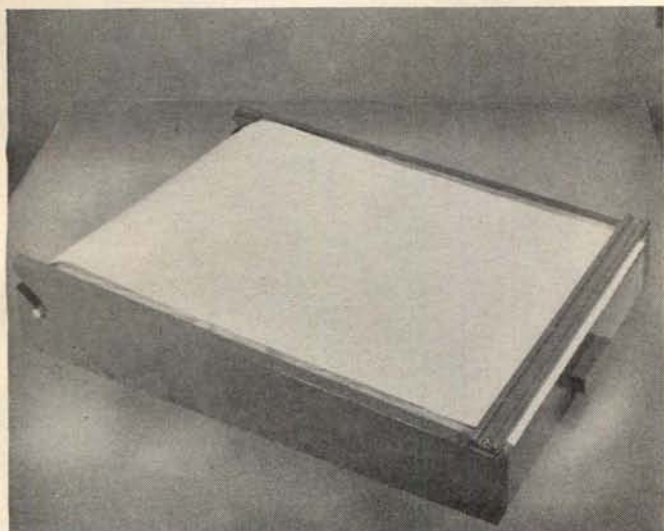
PHOTOGRAPH D—Fit the crayon stick to the front edge of the top. A cardboard washer between the stick and the top allows clearance room for the paper.



PHOTOGRAPH E—Cut two circles of $\frac{3}{4}$ " pine. Drill $\frac{3}{8}$ " holes in their centers and "screw" the circles onto the dowel axle just far enough that they fit inside the roll of paper.



PHOTOGRAPH F—Fit the axle assembly into the roll and slip the ends of the dowel axle into the slots of the sides.



PHOTOGRAPH G—Draw the paper over the top and slip it between the crayon stick and the top.



PHOTOGRAPH H—The young artist approves of the arrangement. When one picture is finished, it is a simple matter to draw down the paper, tear it off against the outer edge of the crayon stick and a clean new surface to draw on is instantly available.

pine each $1\frac{1}{2}$ " in diameter "J". Drill $\frac{3}{8}$ " holes into the centers of each circle and "screw" the circles onto the $\frac{3}{8}$ " dowel axle "K". See Figure 4 and Photograph E.

Slip the axle assembly inside the roll of paper and fit the ends of the axle into the slots in the sides of the frame assembly (Photograph F). Draw the end of the paper across the top and under the crayon stick. Photograph G shows the completed drawing board and Photograph H shows it in use.

The board is finished by applying two coats of shellac and one of wax to the top. Sides and drawer front and crayon stick are painted with two coats of quick drying enamel. The paint and shellac job may be more neatly done before the top board is glued into place.

Materials List:

$\frac{3}{4}$ " Pine stock—For frame sides, drawer slides, cross sticks, drawer front, drawer handle, axle circles.

$\frac{1}{4}$ " Plywood—For frame top, drawer sides, drawer back, drawer bottom.

$\frac{3}{8}$ " Dowel—For axle, piece 15" long.

Small brads, wood screws, glue.

Roll of shelf paper.

Glue.

Tools List:

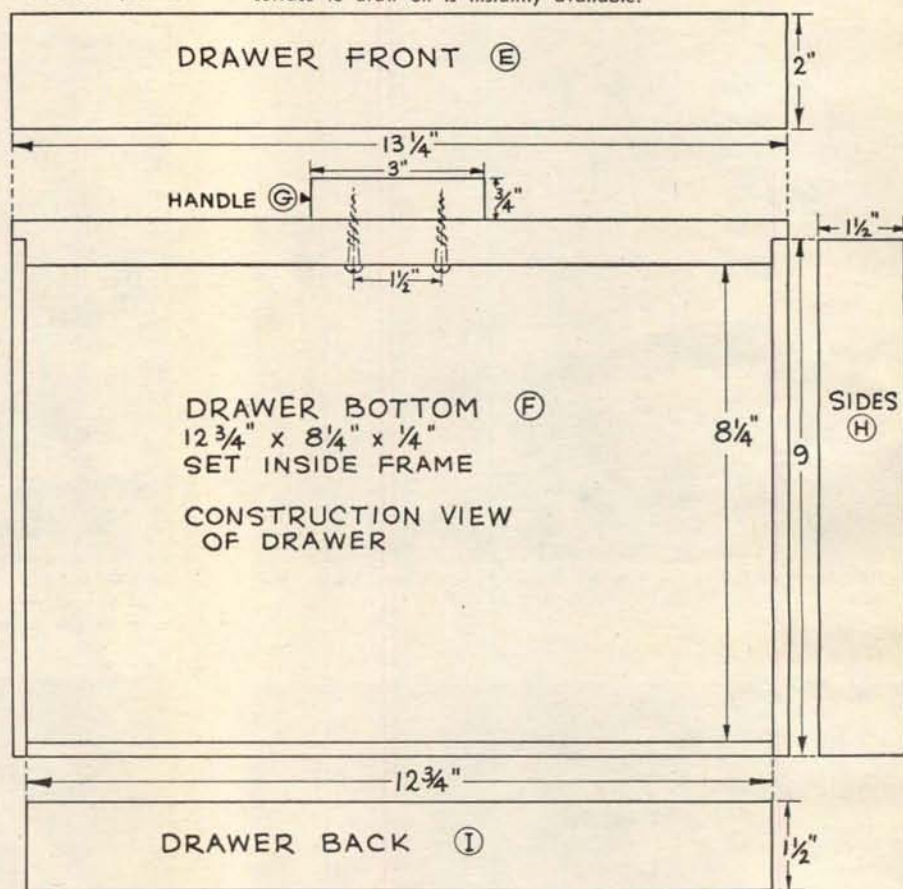
Power saw with dado head or hand-saw and chisel and mallet for cutting dados.

Hammer.

Screwdriver.

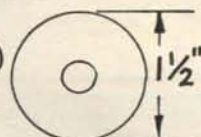
The End

FIGURE 3

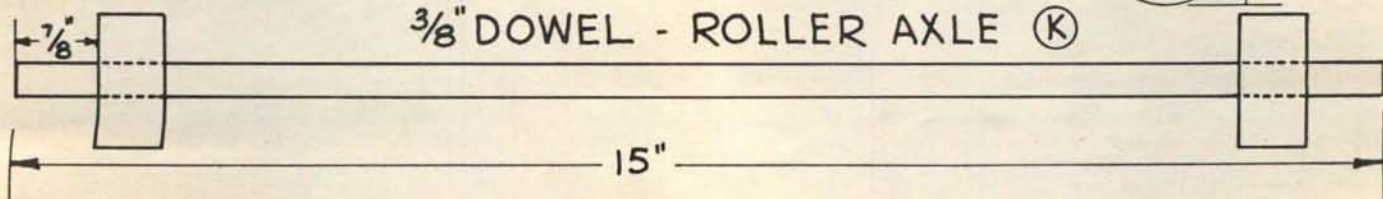


DRAWER SIDES, BACK, BOTTOM - $\frac{1}{4}$ " PLYWOOD
DRAWER FRONT, HANDLE - $\frac{3}{4}$ " STOCK

ROLLERS (J)
 $\frac{3}{4}$ " STOCK



$\frac{3}{8}$ " DOWEL - ROLLER AXLE (K)



THIS LITTLE sleigh is just the right size for an infant to fit in snug and warm. With the detachable handle it can be pulled or pushed.

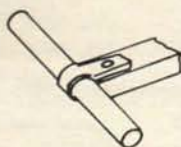
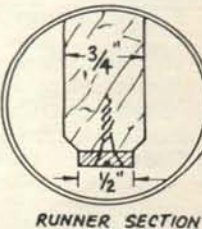
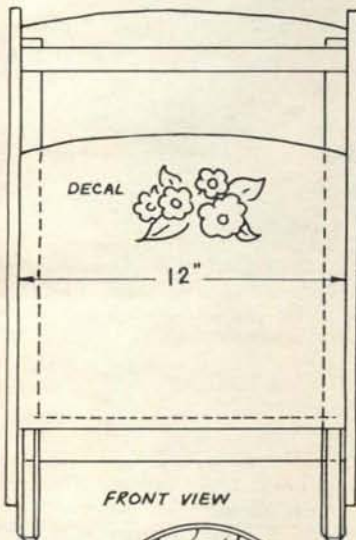
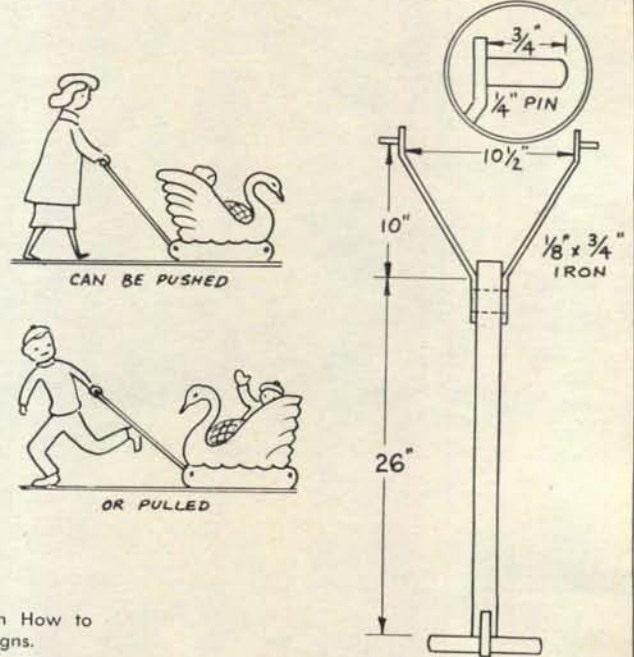
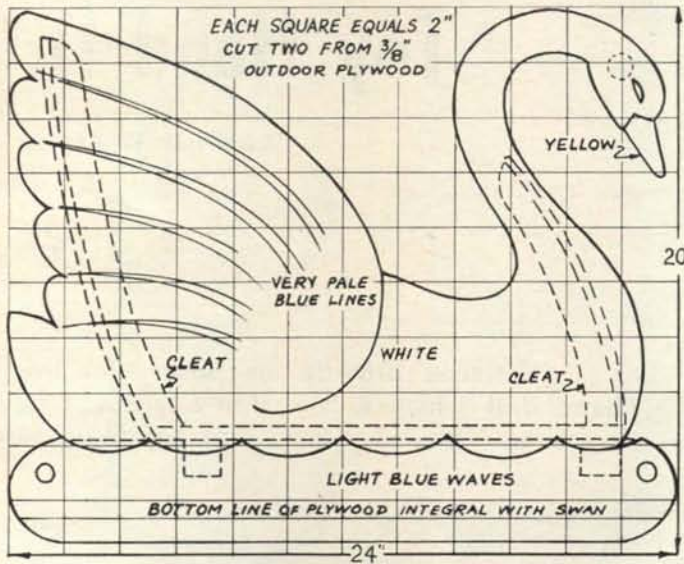
The sides and floor are $\frac{3}{8}$ " exterior grade plywood, dashboard and back of $\frac{1}{8}$ " tempered hardboard nailed to curved cleats, as shown. Apply casein glue to all contacting surfaces before painting. Use finishing nails through the plywood to secure the cleats. Note that there is an extension at the bottom of the swan to be glued

and nailed to the wood runners. The wave effect is painted, not scroll-sawed. Runners are bevelled on the lower edges and shod with $\frac{1}{8}$ " x $\frac{1}{2}$ " strap iron, secured with countersunk flathead screws.

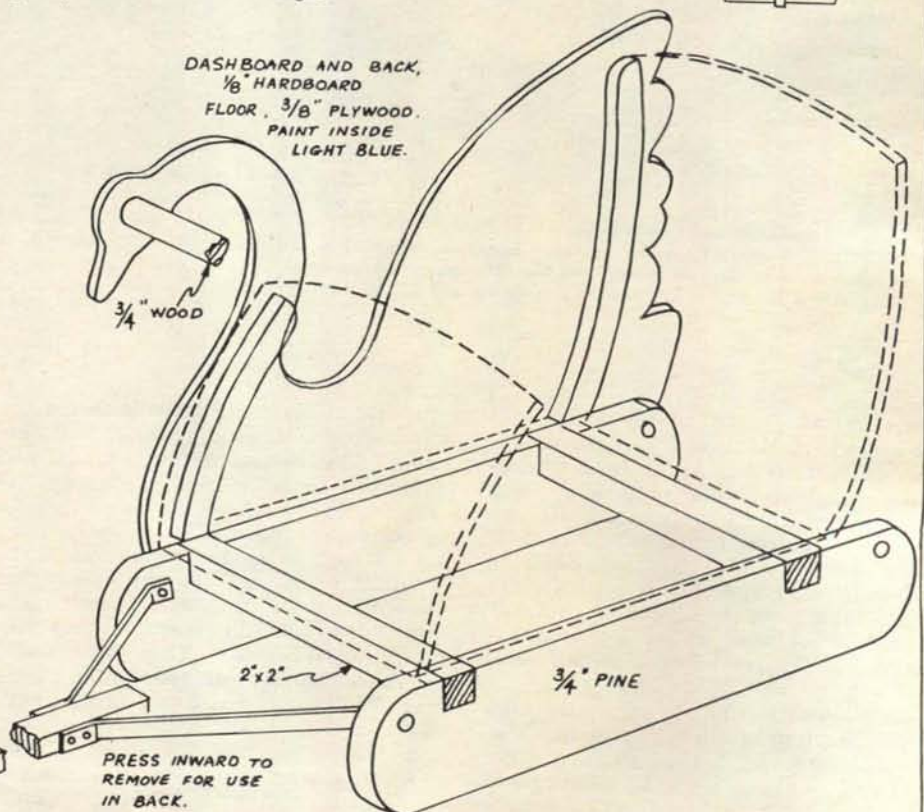
The strap iron fork at the end of the tow-bar can be squeezed together just enough to draw the pins out of the holes at either end. Paint the swan white with faint blue lines indicating feathers; the entire runner area should be light blue, as well as the inside of the sleigh.

Swan Sleigh

HI SIBLEY



See page 56 for directions on How to Enlarge Squared Patterns and Designs.



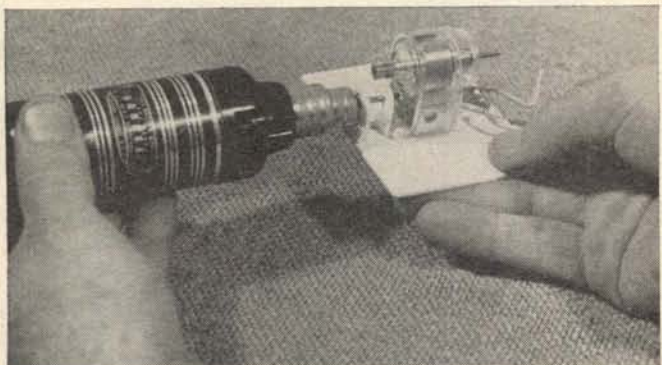


PHOTOGRAPH 1—Made from a peanut can and powered by batteries, this toy hand drill features a reversing switch enabling Junior to drive stove bolts in and out of the special coffee-can rig shown here.

Turn a Tin Can into a Toy Hand Drill

RONALD L. ANDERSON

Batteries provide the power for this toy hand drill which will enable any small boy to emulate his father with complete safety.



PHOTOGRAPH 2—Here the motor has been cemented to the motor platform made from a piece of plastic wall tile. The motor is shown being recessed with a shallow 3/32" hole to receive the end of the shaft.



PHOTOGRAPH 3—Here is the drill handle with the plastic doorbell which serves as a trigger switch and the two side plates which hold the switch in place. Peanut can and lid are also shown.

THIS BATTERY powered toy hand drill (Photograph 1) features several accessories that will keep Junior occupied for hours—and will keep him away from Dad's power tools. He can buff and polish, erase pencil marks, mix liquids and run stove bolts in and out of a special rig with it, yet can't harm the furniture or himself. It's safe because of its low power—mere pressure of the hand will stop it.

A standard small peanut can (or a 1-lb. shortening can) measuring $3\frac{1}{8}$ " in diameter by $2\frac{3}{4}$ " high forms the housing, while a piece of plastic wall tile $2\frac{1}{2}$ " by 3" by $\frac{1}{16}$ " thick serves as a motor platform.

Saw out a "U" shaped frame from $\frac{3}{4}$ " pine (Figure A) and position on

the tile as shown. Fasten with screws through the plastic from the underside. The motor is then positioned and cemented to the tile using the kind of cement used on plastic model planes (Photograph 2).

The motor is $1\frac{1}{2}$ to 3 volt D.C., available in any hobby shop for about \$2. A "Tiny Atom" motor made by Wilson's of Cleveland is shown in the illustrations. This firm also makes a variety of gears and shafts for the motor which are also available in hobby shops.

A 14-tooth brass pinion gear is attached to the motor shaft and turns a 36-tooth spur gear $\frac{3}{4}$ " in diameter. The spur gear is mounted on a $\frac{3}{32}$ " shaft (also available) $1\frac{1}{2}$ " long which is supported by two plastic arbors

$\frac{1}{2}$ " wide with the $\frac{3}{32}$ " hole drilled $\frac{3}{4}$ " up from the bottom. The arbors are made from $\frac{1}{16}$ " styrene or can be formed from metal bent in the shape of a "U."

Note that a shallow hole is drilled into the plastic motor housing itself to receive the end of the shaft (Photograph 2 and Figure B). Thus the motor provides solid backing for the shaft should Junior bear down a bit too hard on the drill.

THE HANDLE is cut out of $\frac{3}{4}$ " pine and notched out for a plastic doorbell switch which serves as a "trigger" (Photograph 3 and Figure A). Wires from the switch run up through the handle into the housing. Side plates on the handle hold the switch in place.

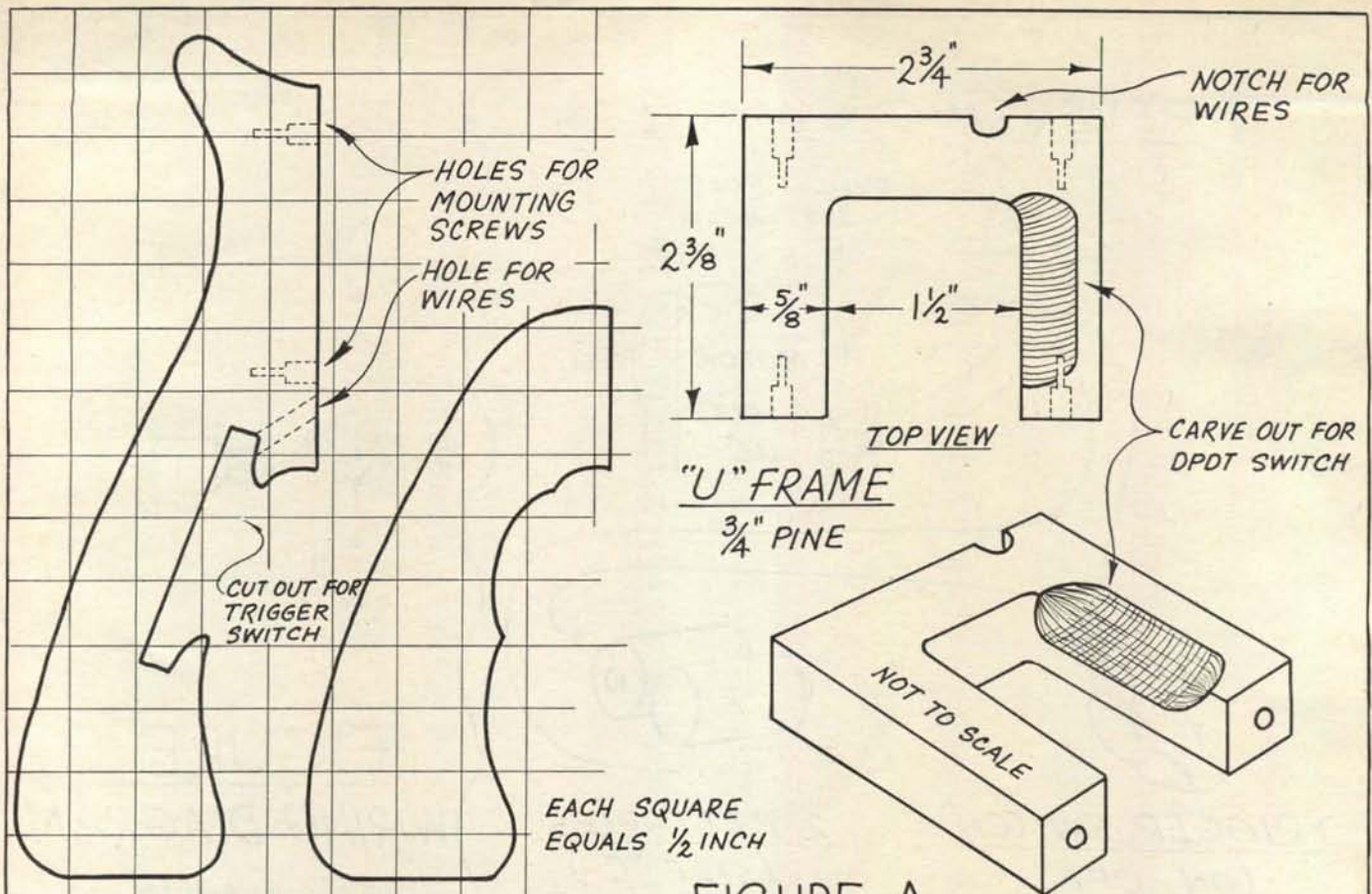


FIGURE A

HANDLE
3/4" PINE

SIDE PLATES (2)
1/8" BALSA OR PINE

FIGURE A—Patterns for the drill handle, side plates and the wood "U" frame are shown here. Note that the "U" frame is notched out on the left hand side to leave room for a DPDT switch.

FIGURE B

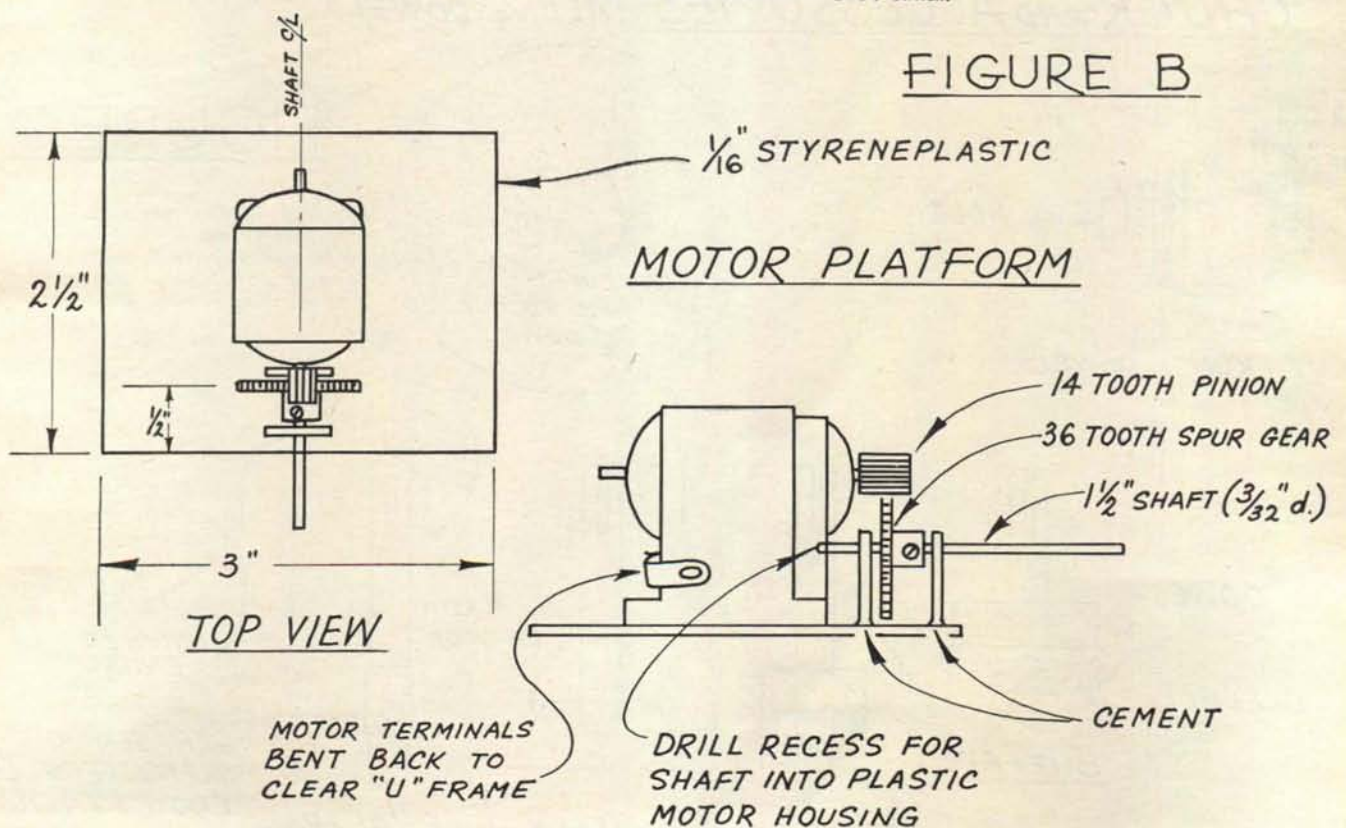


FIGURE B—Here details of the motor mount and the 2 1/2-to-1 gear reduction system are shown. Arbors can be made from plastic, as shown, and cemented in place, or from metal and bolted in place. See page 56 for directions on How to Enlarge Squared Patterns and Designs.

REVERSING SWITCH

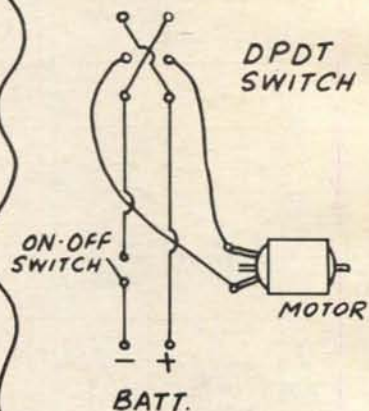
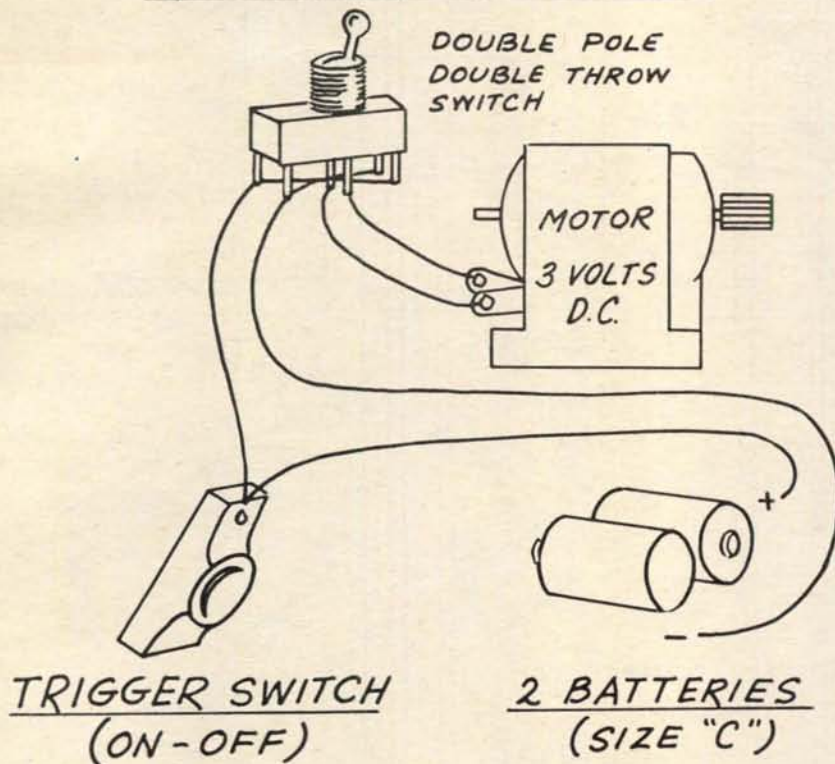


FIGURE C
WIRING DIAGRAM

FIGURE C—This shows how on-off switch and double pole, double throw switches are wired into the circuit for proper operation.

CHUCK AND ACCESSORIES (ALL $\frac{1}{4}$ " DOWEL)

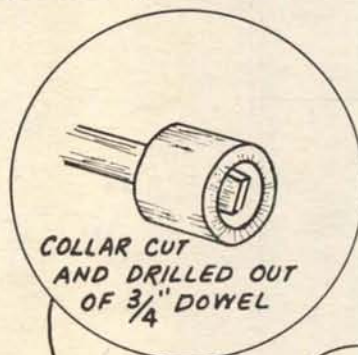
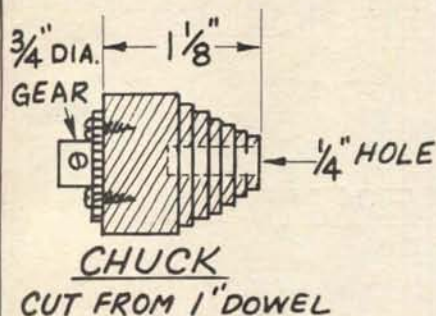
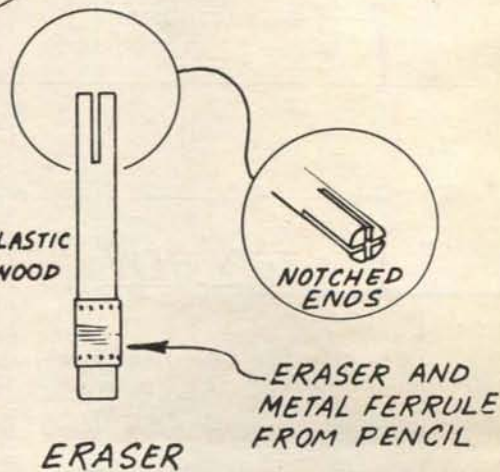
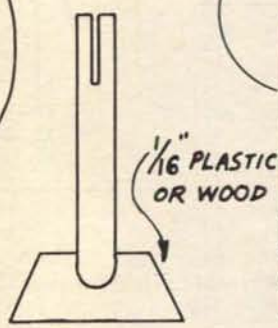
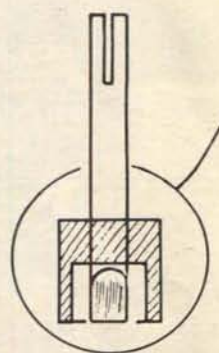
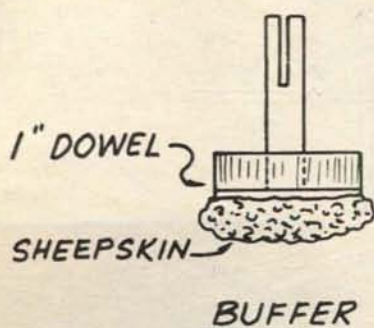
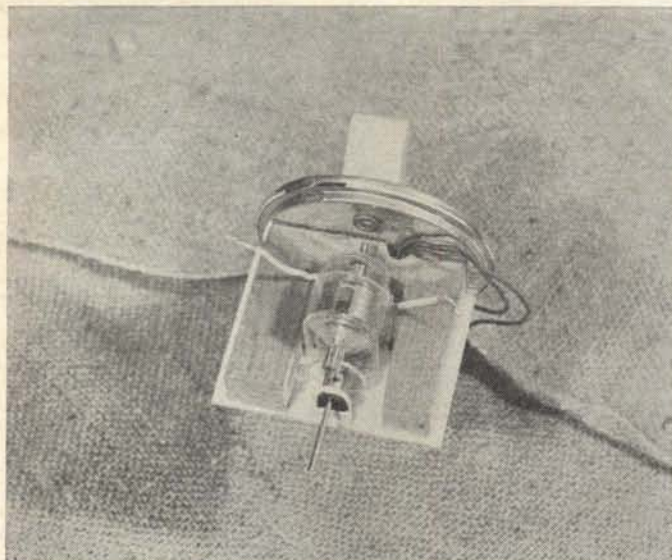


FIGURE D

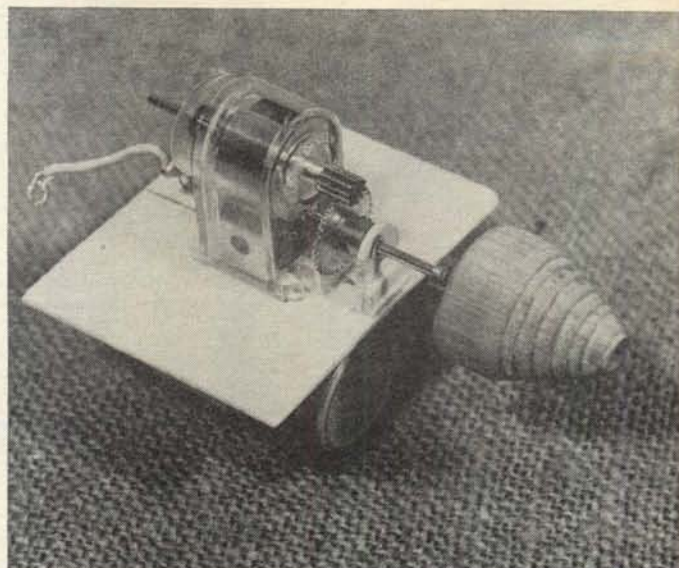
FIGURE D—Here are details of four accessories for the toy drill. Note special retaining collar for screwdriver to prevent blade from slipping out of notch in screw.





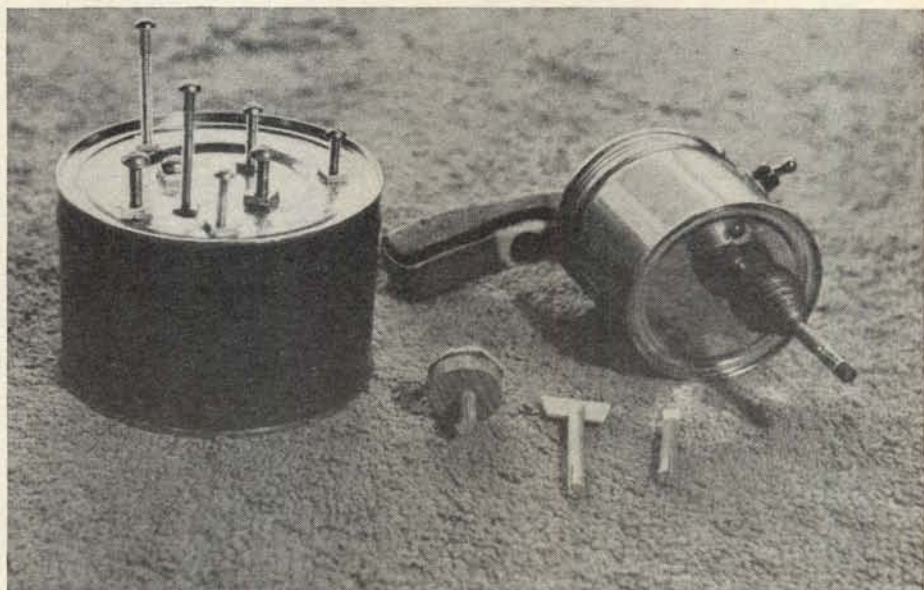
PHOTOGRAPH 4—Overhead view shows the motor, platform and "U" frame attached to the can cover, which in turn is attached to the drill handle with wood screws.

PHOTOGRAPH 6—Rear view of the 1" diameter chuck shows how $\frac{3}{4}$ " gear is attached with screws. Set screw in gear hub locks chuck on shaft.



PHOTOGRAPH 5—This view shows relationship between chuck, motor, gears and batteries which are mounted in model airplane battery box underneath. Uses two size C batteries.

PHOTOGRAPH 7—Coffee can with holes punched in top and nuts for stove bolts soldered over them provides a rig for driving bolts in and out with the hand drill. Other accessories are also shown, including buffer, mixer, screwdriver and eraser.



Note that the peanut can lid is attached to the handle with two wood screws. Then the "U" shaped wood frame—motor attached—is fastened to the lid with screws also (Photograph 4).

A double pole, double throw switch is wired in to reverse the motor (Figure C). This enables Junior to drive stove bolts in, then turn them out again, accounting for much of the attraction of this toy.

The DPDT switch is mounted in a $\frac{1}{2}$ " hole drilled in the left hand side of the can near the top. The drill shown was made for a southpaw, so the DPDT switch is pictured on the opposite side.

Two size "C" batteries are required and these are best mounted in

a standard model airplane battery box available in hobby shops (Photograph 5). This can be fastened with screws or taped to the bottom of the plastic motor platform.

Drill a $\frac{1}{8}$ " hole in the bottom of the can for the shaft and also holes for mounting screws. When the drill has been assembled, the chuck and accessories come next.

The chuck (Photograph 6 and Figure D) is a short length of 1" dowel which is tapered. This can be done on a table saw by rotating the dowel on the blade and then successively increasing the depth of the cut forming a step-down.

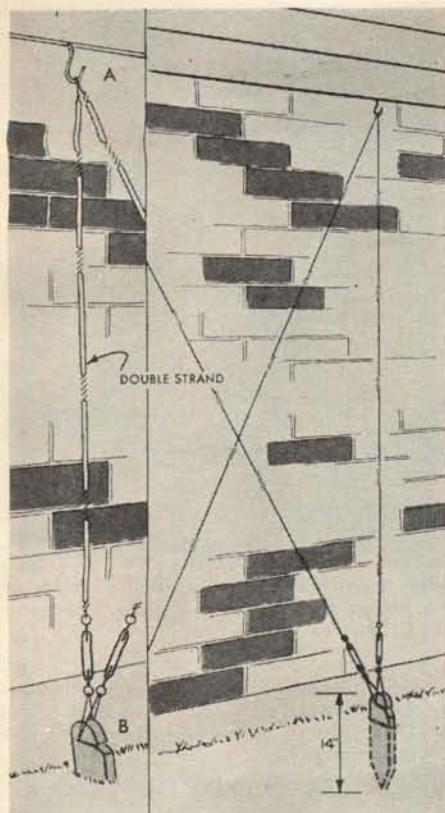
A 36-tooth spur gear is attached to the back of the chuck with three small screws (Photograph 6). The

set screw in the gear hub makes it possible to lock it on the shaft. A $\frac{1}{4}$ " hole is drilled in the front of the chuck to receive the accessory items.

These are made from $\frac{1}{4}$ " dowels (Figure D) slotted for an easy compression fit in the chuck. Others can be devised in addition to the four shown. One note about the screwdriver: A collar made from $\frac{3}{4}$ " dowel with a $\frac{1}{2}$ " hole drilled in one end can be slipped over the blade of the screwdriver so that it will not slip off the head of the stove bolt.

The stove bolt nuts are soldered over holes punched in a one-pound coffee can lid (Photograph 7). Use bolts of several sizes so the correct bolt must be fitted to each nut.

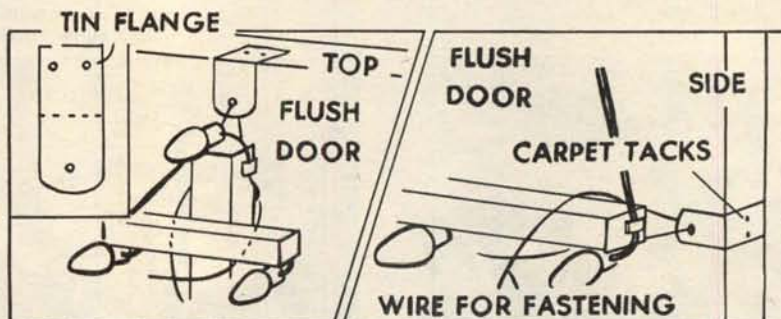
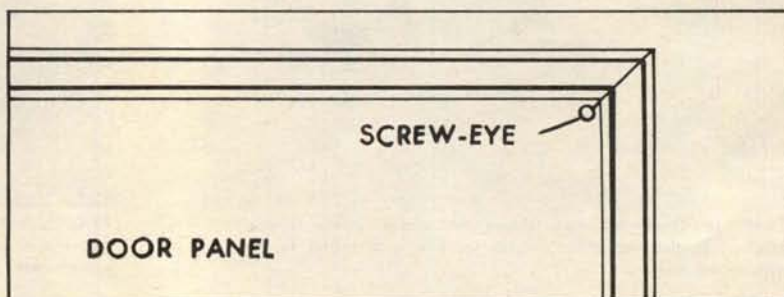
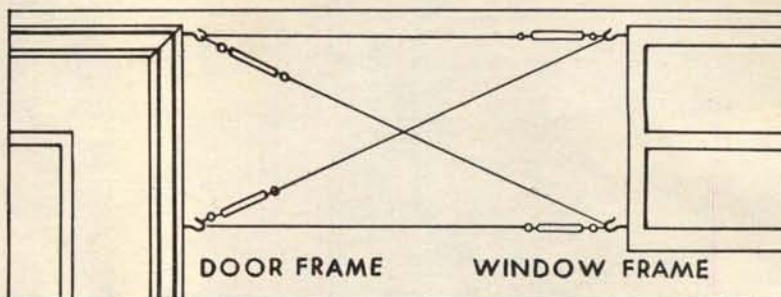
THE END



Twist two lengths of baling wire together at 18" intervals to make a double strand of wire. Then string a crisscrossed pattern of "double strand" wire—from 2½" clothesline hooks inserted in the underside of wood window sills or eaves above (A), to 8" turnbuckles attached to 14" notched wood stakes at the base of the facade (B). When you fasten your decoration to the wire pattern at several points (just above the twists), it will not slip.

Simple Ways to Hang

Your Christmas Decorations



If vertical hanging is not feasible, try a horizontal arrangement. Fasten clothesline hooks along door and window frames with turnbuckles and the crisscrossed wire pattern attached to the hooks. Use short pieces of wire to fasten your decoration to the wire pattern.

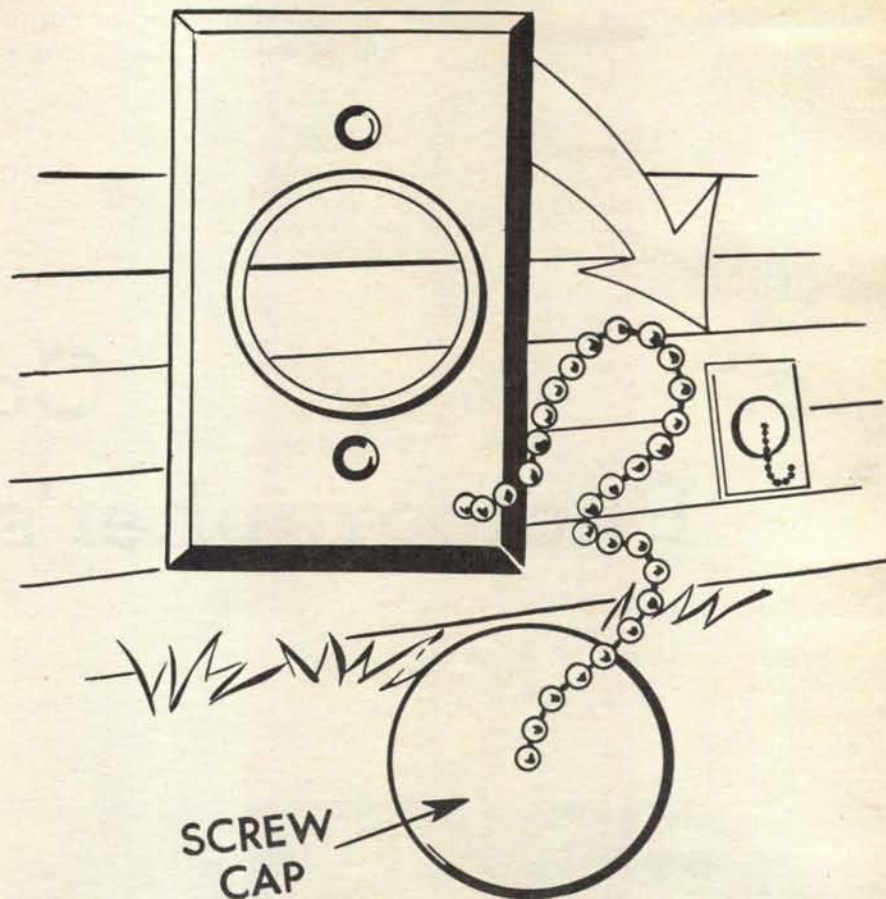
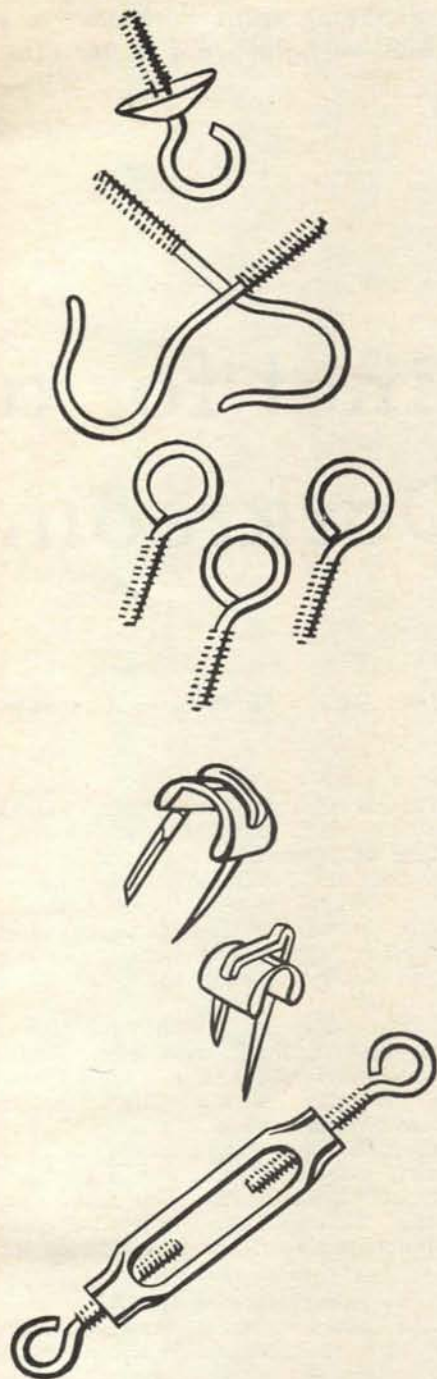
To mount door decorations, hold device to door panel and mark points along the molding (at joints, if possible) for insertion of ⅜" screw eyes. One each at the top and bottom—or at either side—should serve as "anchor points" for most devices. To actually fasten the device to the door, run short lengths of baling wire

through each screw eye and twist ends tightly about decoration.

For flush doors cut three 1" x 3" tin strips from ordinary tin cans. In each, punch two holes (with nail) at one end and one hole at the other. Bend strips into right angles to form flanges. Tack one flange on top and both sides of door, using tape under door side of flange to prevent marring. Run baling wire through single holes and twist tightly about device to be hung.

These same principles may be applied to the hanging of most doorway and facade decorations, regardless of their size and shape.

Photographs by General Electric



The best sources of electrical power are outdoor weatherproof receptacles or outlets, with screw-cap or hinged lids. If your home is without such receptacles, they can easily be in-

stalled by a local electrician and be used for many other purposes throughout the year. Garage light, porch or lantern light sockets may also be used as a power source.

Brass cup hooks are used outdoors to hang string sets—or to hold wire for hanging lightweight decorative devices.

No. 8 curved screw hooks support wire frames for heavier decorations.

To "start" screw eyes, first tap a small guide hole in wood with a nail; then insert screw eye and twist. For doors, use $\frac{3}{8}$ " to $\frac{5}{8}$ " screw eyes.

Always use insulated staples to fasten electrical cord or string sets to wood or hardboard surfaces.

8" turnbuckles (or larger) should be used to keep wire frames taut. Since wire stretches, turnbuckles will take up slack, if required.

An example of results obtained after wire "skeleton" has been covered is shown at the right.



An essential piece of furniture in a photographic darkroom is a sturdy cabinet. Here's one with a built-in, light proof paper safe.

Cabinet for a Photographer's Darkroom

Photographs and Plans from Douglas Fir Plywood Association



THE BEST WAY to get out of the "brownie" class in photography is to do at least some of your own developing. You can pay for the fun you will have with the money you save, but you need a place to work. Here's a simple fir plywood do-it-yourself darkroom storage cabinet with shelf space and paper safe that's easy and economical to build.

THIS IS a simple darkroom cabinet which can be built by even an amateur at minimum cost with fir plywood. You'll still have to depend on the kitchen for water and washing, but the cabinet has a paper safe, shelf storage, a good counter surface, and plenty of storage space below the counter.

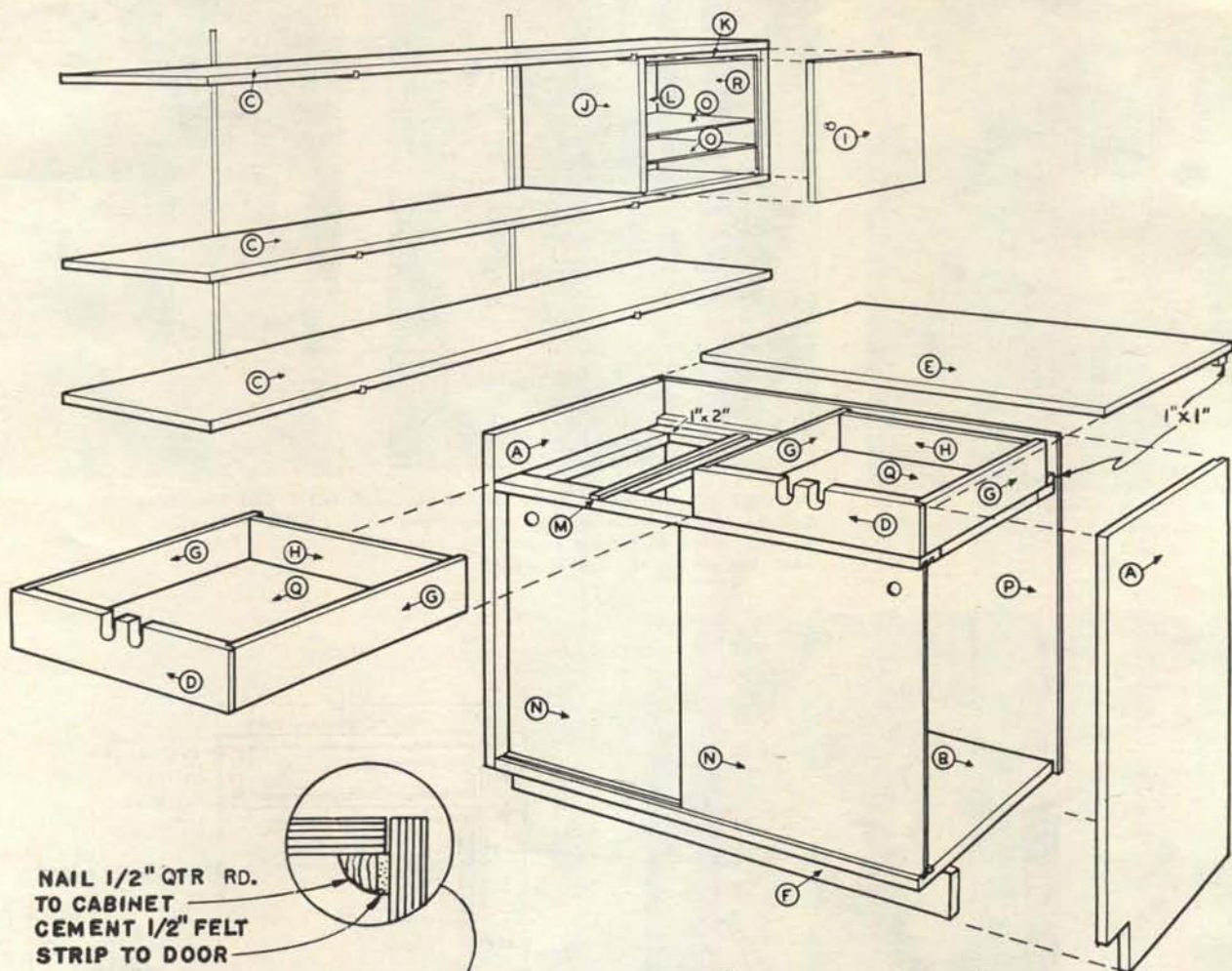
You can make it with three pieces of plywood: one $\frac{3}{4}$ -inch panel, 4' x 8', one $\frac{1}{2}$ -inch panel, 4' x 2'6", and one $\frac{1}{4}$ -inch panel 4' x 5'. The following will also be needed: 1 x 2 lumber for the shelf supports, a metal molding strip for the counter top, a resilient plastic surfacing for the counter top, adjustable shelf standards for shelves and paper safe, some felt strips for the paper safe, glue and fastenings.

The job should be started by cutting out the parts for the main counter cabinet. If necessary, adjust any dimension to your available space. The parts for the drawer supports should be cut from the 1 x 2 lumber.

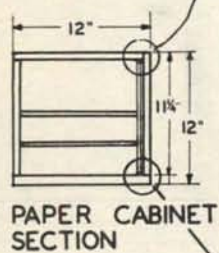
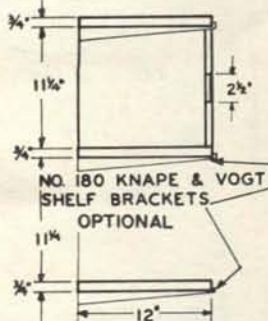
Now, dado the grooves in the bottom piece for the cabinet to take the sliding doors and dado the front edge of the shelf support on the underside. Make the grooves for the bottom edges of the doors $\frac{5}{16}$ " wide and $\frac{1}{4}$ " deep. Make the grooves for the upper edge of the doors $\frac{3}{8}$ " deep so you can lift into place and take them out when necessary.

Assemble the framework for the drawer supports.

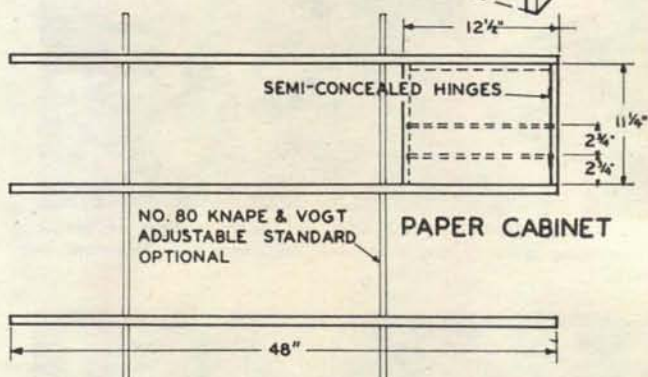
Nail and glue the back of the cabinet to one of the side pieces. Then attach the second side the same way. Install the bottom of the cabinet. Put the drawer support into position and attach the drawer guides, "M".



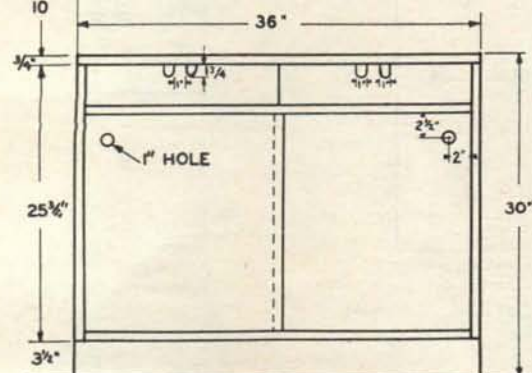
NAIL 1/2" QTR. RD.
TO CABINET
CEMENT 1/2" FELT
STRIP TO DOOR



PAPER CABINET
SECTION



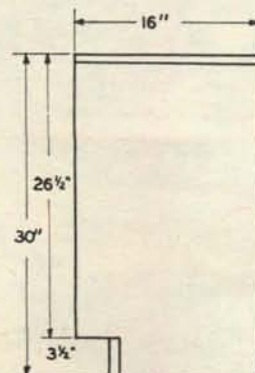
PAPER CABINET



FRONT ELEVATION



NAIL 1/2" QTR. RD.
TO CABINET
CEMENT 1/2" FELT
STRIP TO DOOR



END ELEVATION



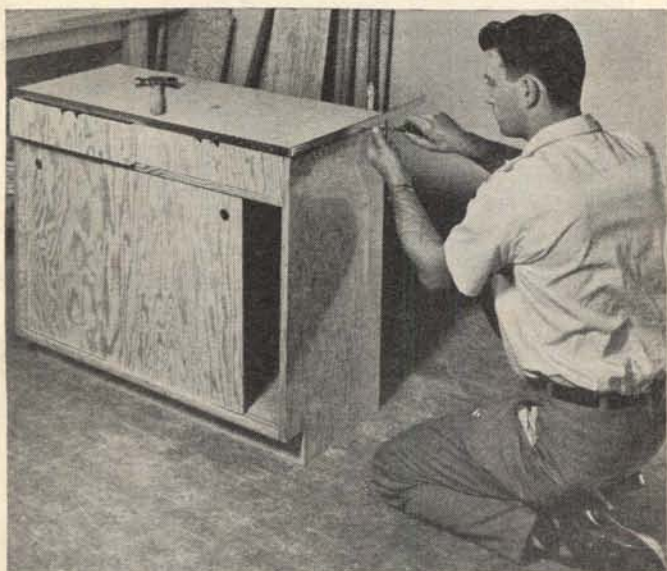
BEGIN THE JOB by cutting out the parts. Assemble the counter and storage cabinet first. It's the biggest part of the job.



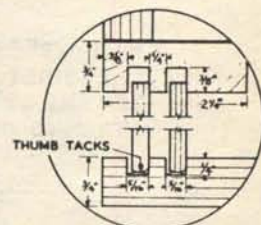
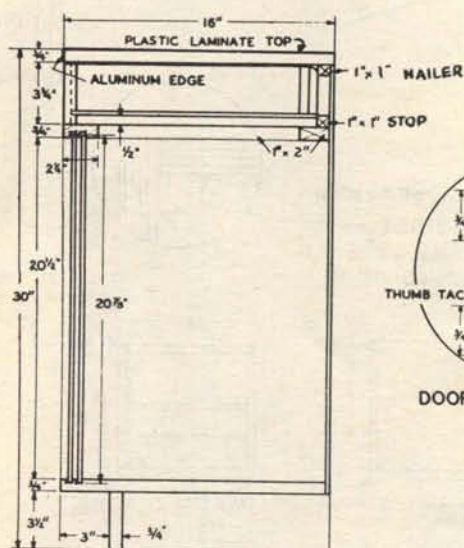
ASSEMBLE it in this order: attach side to back, then second side. Set in the bottom and drawer supports, install the surface beneath the bottom shelf, then put the top shelf into place.



NOW CUT the parts for the drawers and assemble them.

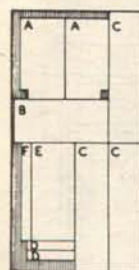


NEXT, FACE THE COUNTER TOP with any good resilient or plastic counter surfacing material and then bind the edges with aluminum or metal moldings.

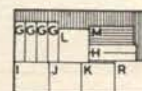


DOOR DETAIL

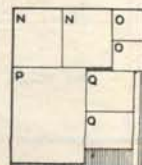
SECTION



3/4" x 4'-0" x 8'-0" PLYPANEL A-D
CUTTING DIAGRAM



1/2" x 4'-0" x 2'-6" PLYPANEL A-D



1/4" x 4'-0" x 5'-0" PLYPANEL A-D

BUILD THE PAPER SAFE right onto one of the shelves. Outline the door opening in heavy felt to catch the light and then put the door into place.

PARTS SCHEDULE

CODE	NO. REQ'D.	SIZE	PART IDENTIFICATION
A	2	16" x 29 1/4"	Ends
B	1	15 3/4" x 34 1/2"	Bottom
C	3	12" x 48"	Shelf
D	2	3 3/4" x 17 3/8"	Drawer Front
E	1	16" x 36"	Top
F	1	3 1/2" x 36"	Base
G	4	3 3/4" x 14 5/8"	Drawer Sides
H	2	3" x 16"	Drawer Back
I	1	11 1/4" x 12 1/2"	Door—Paper Cabinet
J	1	11 1/4" x 11 1/2"	Side—Paper Cabinet
K	1	11 1/2" x 11 1/2"	Top—Paper Cabinet
L	1	10 3/4" x 11 1/2"	Back—Paper Cabinet
M	6	3/4" x 15 1/4"	Drawer Guides
N	2	17 7/8" x 20 7/8"	Door
O	2	11" x 12"	Shelf—Paper Cabinet
P	1	25 3/4" x 35 1/4"	Back
Q	2	14 5/8" x 16"	Drawer Bottom
R	1	11 1/4" x 12"	Side—Paper Cabinet
	14 Lin. Ft.	1" x 2"	Framing
	1 Pr.	For 1/2" Plywood	Semi-Concealed Hinges
	4 Lin. Ft.	—	Felt Strip and Qtr. Round
	6 Lin. Ft.	—	Adjustable Shelf Standard
*	6 Ea.	—	Shelf Brackets—12"
	6 Lin. Ft.	1" x 1"	Drawer Stop and Nailers
	Miscellaneous—4d and 6d Finish Nails		
	Waterproof Glue		

* Optional—Use fixed brackets if desired.

Close in the space beneath the bottom shelf. Cut and assemble drawer units. Nail the top of the cabinet "E" to the sides.

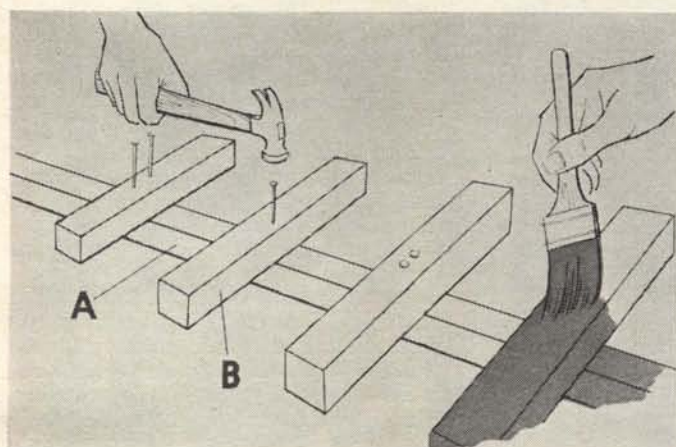
Drill holes in the doors for handles and install them in the cabinet. Lay down the counter surfacing for the top following the manufacturer's directions for the material you use and finish it off with aluminum or metal edges.

Except for finishing, that should do the trick.

The next job is comparatively simple. Cut out the shelves. Build the paper safe onto one shelf, using the shelf surface as the bottom of the safe.

When building the paper safe shown, fit all pieces carefully to insure light-tight joints. Note that side "R" projects 1/2" past front edge of side "J", for hinging. Dado sides for shelves, nail to back and top, and install by nailing up through middle shelf "C". Fit shelves "O", hang door, finish completely and apply felt strips and quarter-round to keep out light. Hang shelves on adjustable standards or fixed brackets, as desired.

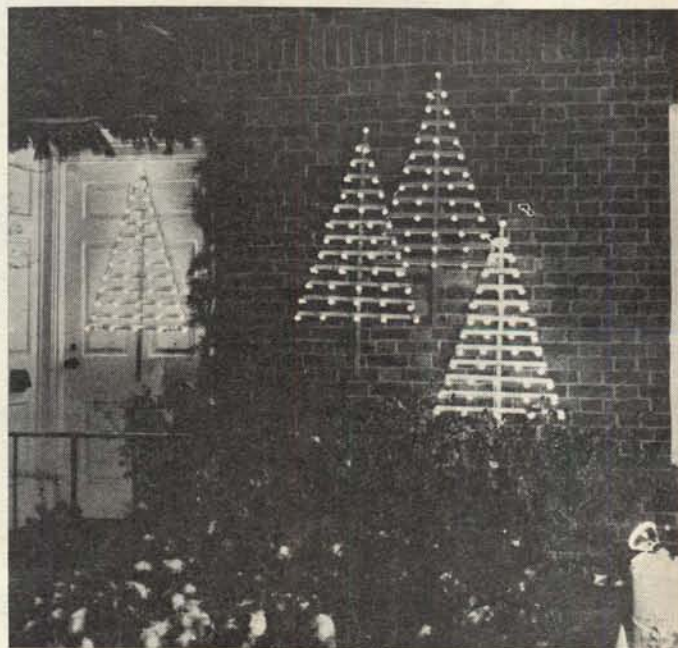
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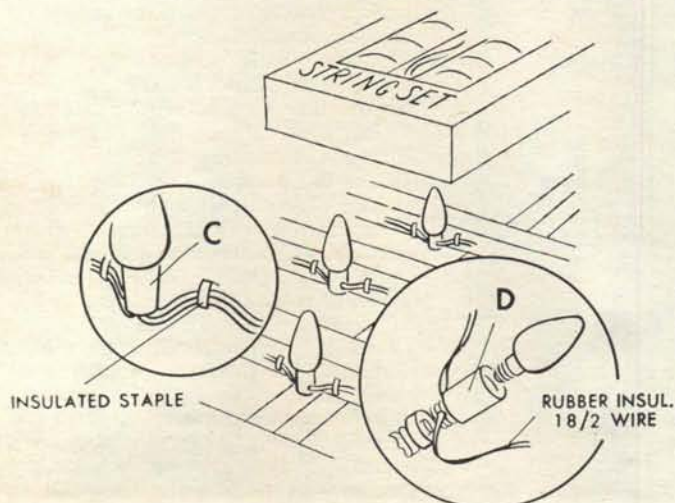
Exterior Yule Decoration

Photographs by General Electric

YOU CAN BUILD this striking decoration in your basement! The four tree "trunks" (A) are made of 3/4" soft pine 48" long. Crosspiece "branches" (B) ranging from 3" at the top to 24" at the bottom are nailed 3" apart along each trunk.



THE NUMBER OF LAMPS per branch on the trees shown above can vary from two to five, from top to bottom with one lamp at the trunk's peak.

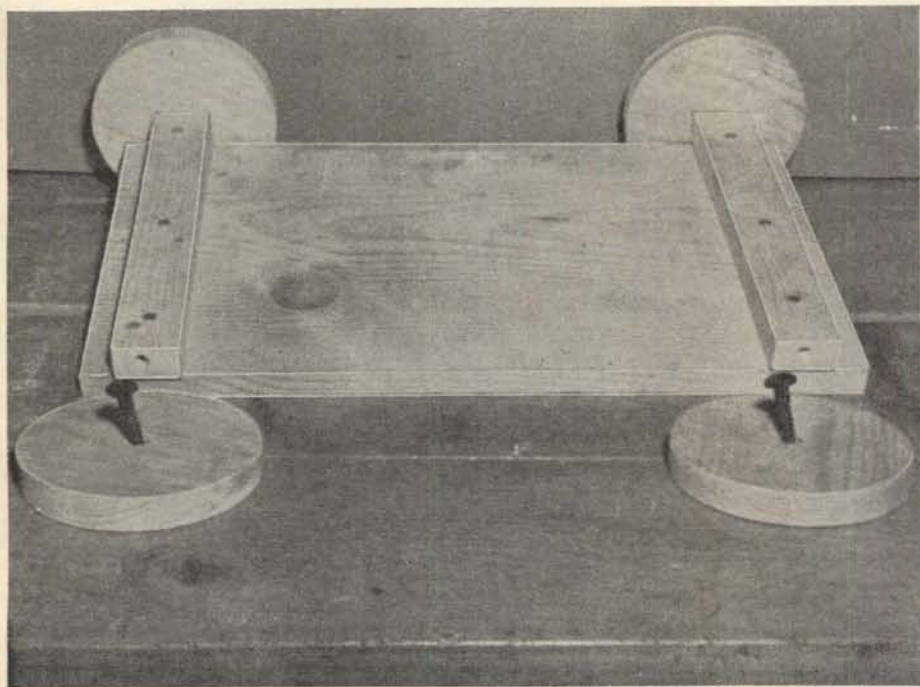


STAPLE STRING SETS (C), or "add-on" type sockets (D), and tape wire to the undersides of each "branch." After three trees have been painted and wired, they may be nailed together with splints to form a single sturdy unit for the facade. Place a PAR-38 floodlamp on the ground 6 feet from the facade unit to fill in background.

Here's an up-to-the-minute toy that will delight that imaginative youngster by enabling him to play TV cameraman.

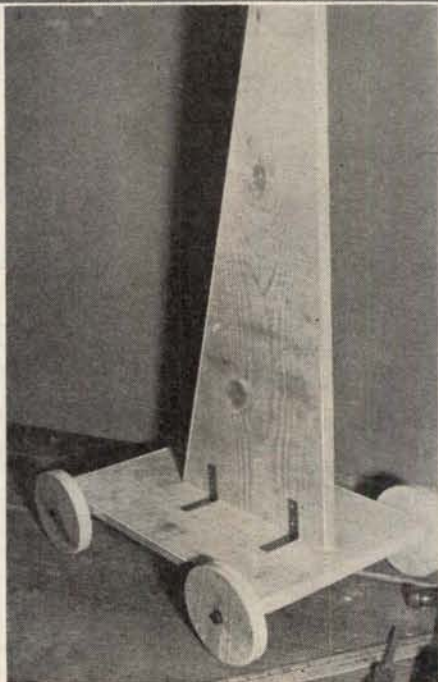
Make-Believe Television Camera

LARRY ROTHMAN



PHOTOGRAPH 1—The dolly showing two wheels in position, the bracings in place and two drilled holes ready for the other two wheels.

PHOTOGRAPH 2—The assembled dolly and pedestal. Note shelf braces in place to add stability to the upright member.



HERE'S A workshop project that will warm the hearts of the pint-sized TV-addicts in your house on Christmas morning. Now that the television manufacturers have made it possible for each small citizen to have a portable set of his own—how about building a TV camera for him, too? Of course this model runs on "kid power" not electric power. But it will provide many winter hours of indoor fun for the sprouts who can create their own imaginary TV shows.

Our kid-sized camera is made up of the following sections: Dolly—the small wheeled platform on which the camera is mounted; Pedestal—the upright portion attached to the dolly, and upon which the camera is mounted; Mounting—the circular piece placed on top of the pedestal that supports the camera; Camera—the box which holds the turret with its three lenses and transmits the picture image (of course this one won't). We will also have an Eye-piece—through which the cameraman looks to see the scene he is taking; a Guide Bar—the handle which the cameraman uses to turn his camera left and right, and Ear-phones which connect (in the case of a real camera) the cameraman to the director in the control room.

Let's make the dolly (Photograph 1) first. It is made from a piece of 1" x 12" board, 18" long (we used white pine). Cut a piece of 1" x 2" the width of the platform and use as bracings at either end of the dolly to serve as axles for the wheels. The wheels were cut on a band saw from 1" x 12" pine too, and are 5" circles with $\frac{1}{4}$ " holes drilled in the exact center. To simplify mounting of the wheels, so that they would roll easily, we used heavy, square-headed screws. The bracings were drilled first so the screws wouldn't split them and they were screwed to the bottom of the dolly about $\frac{1}{2}$ " from each end.

The pedestal (Photograph 2) was also made from a piece of white pine 1" x 12"—30" long. It is 11½" at the

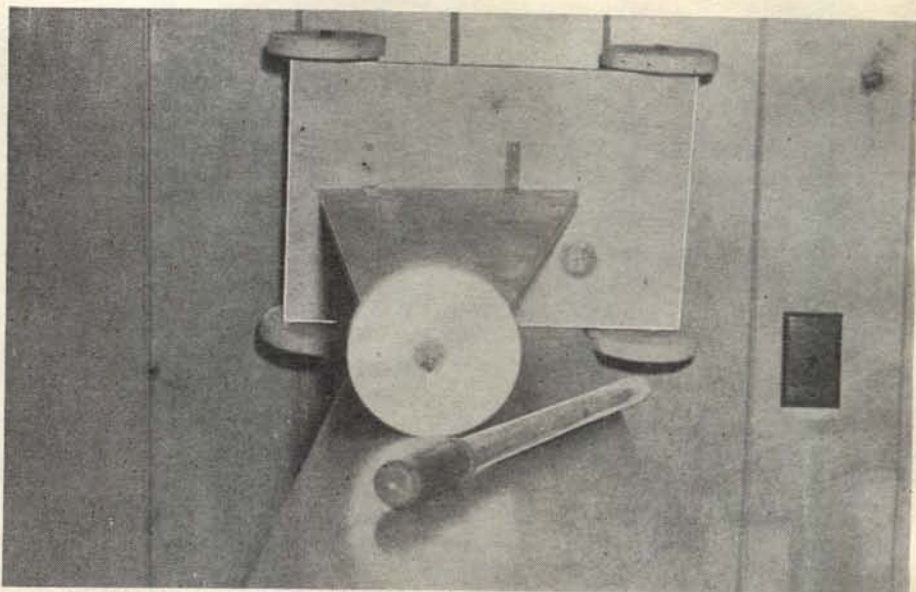
bottom and 5" at the top. We centered it on the dolly $1\frac{1}{2}$ " from one end and affixed it from underneath with wood screws. To add stability, because of its height and the weight of the camera on top, 2" shelf braces were attached to each side at the bottom and to the dolly.

On top of the pedestal is a 5" circle (Photograph 3) with a $\frac{1}{4}$ " hole drilled in the exact center. Through this hole projects a flatheaded $\frac{3}{8}$ " bolt (about three inches long). This bolt will eventually be fed through a hole in the bottom of the camera and then will act as a swivel so camera can be panned (moved from left to right).

OUR PLAYTIME image-orthicon camera itself comes next; it houses the turret mount and its component parts. The turret (Photograph 4)—the flat plate that holds the three lenses—is made of an 11" circle; in this case we used $\frac{1}{4}$ " plywood. To it are affixed, with wood screws, three assorted sized cans. Each can simulates a lens so we chose a frozen orange juice can for the usual 2" lens; a vegetable soup can for the $3\frac{1}{4}$ " lens and a No. 2 crushed pineapple can for the $5\frac{1}{4}$ " or wide angle lens. These give the impression of the three different size lenses found on real TV cameras. To this turret, with its lenses already attached (Photograph 5) we mounted a 1" dowel made from a discarded broom handle, the length of the camera ($16\frac{1}{2}$ "). Eventually at the other end of this dowel we will add the "lens selector." This is also a 5" circle of white pine that acts as a handle base, and a screen door or drawer handle that when turned will also turn the turret at the other end. Before mounting the turret mechanism, drill a one-inch hole in the front and back pieces of the camera box, in the exact center. We suggest nailing the two pieces together with small brads so that the holes will be in the same exact position in each.

For the camera (Photograph 6) itself you will need six pieces of wood (we used plywood here). Top and bottom sections are $10\frac{1}{4}$ " x $16\frac{1}{2}$ "; sides 13 " x $16\frac{1}{2}$ " and front and back $10\frac{1}{4}$ " x 13 ". Using finishing nails, first assemble the top and bottom, front and back; do not put sides on at this time. Next put the dowel (after affixing the turret securely to it—use two brads) through the hole in the front and pass through the hole directly opposite it in the rear. Screw or nail handle-base to this dowel, then fasten handle to base. Test this apparatus by revolving handle to see that it is firm and moves turret freely in clockwise and counterclockwise directions. Lenses will move with turret, of course, thereby simulating lens selection by cameraman.

To make the eyepiece, use a piece of 2" x 4" scrap, 3" long. Make a

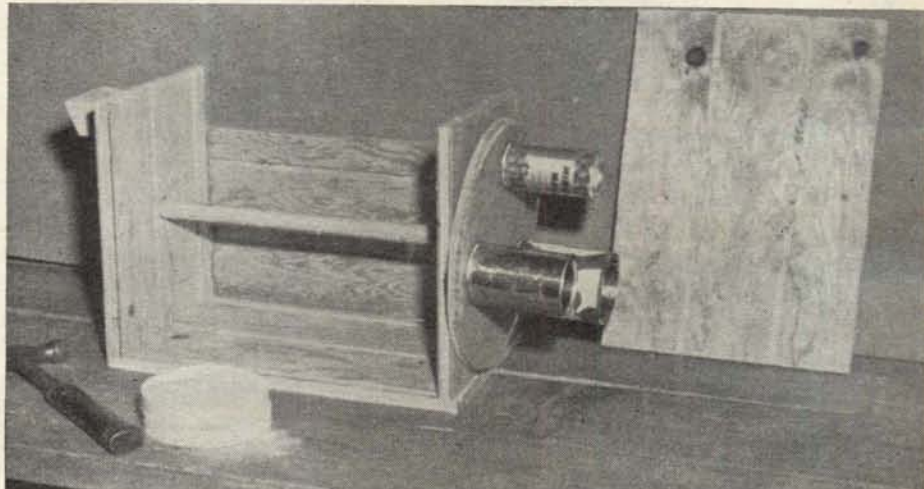


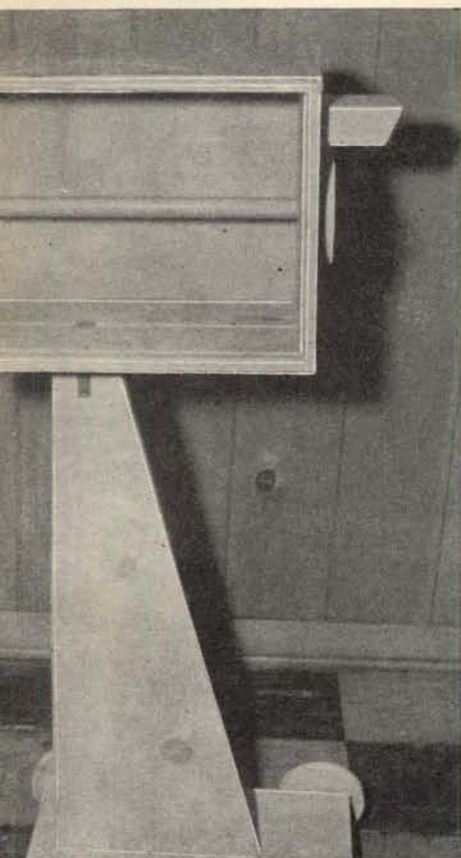
PHOTOGRAPH 3—A bird's-eye view showing 5" circle on top of pedestal. Bolt is shown projecting through center of circle. Guide bar with bicycle handle bar grip is shown in foreground.



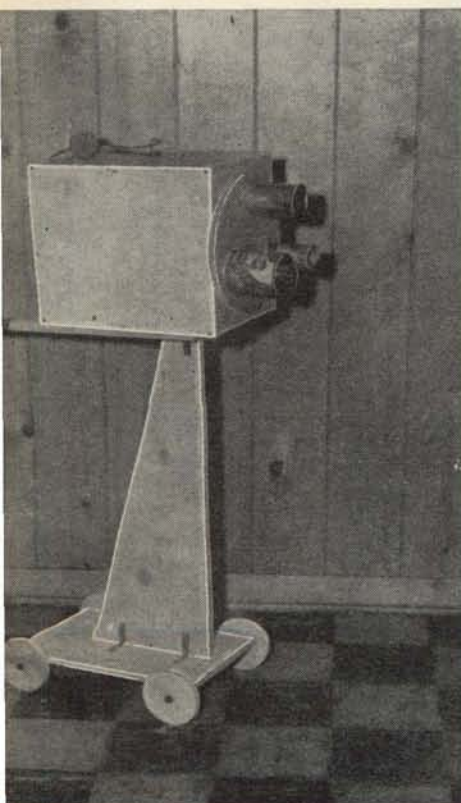
PHOTOGRAPH 4—Shown in the foreground is turret with lenses in place, dowel, handle base and lens selector handle. Rear shows front and back camera sections.

PHOTOGRAPH 5—Partially completed camera with turret mechanism in place. Eyepiece affixed to back of camera. Side pieces shown in rear.





PHOTOGRAPH 6—A close-up of camera box showing turret mechanism in place. Dark spot in bottom of camera is where bolt comes through and is fastened with washer and nut. Note the perfect fit of the turret and "lens selector" base.



PHOTOGRAPH 7—Camera is assembled ready for painting. Although it is shown with earphones in place, these are not added until after painting. Note guide bar in position.



PHOTOGRAPH 8—Our kiddie-cameraman gets ready to dolly in for a close up shot. Camera moves in and back and pans left and right.

diagonal cut along the two-inch width at about a 45-degree angle. From the inside of the back side of the camera screw the eyepiece to the rear of the camera, centered about one inch from the top.

NOW WE are ready to nail on the side pieces of the camera; but first place a large washer over the bolt sticking up from the 5" circle atop the pedestal. Then about 5" back, in the center of the camera bottom, drill a 1/4" hole. Through this hole feed the shaft of the bolt. Using a washer again, first, put on the nut and tighten so the camera is firm, but still can have movement from left to right. Now, nail on the sides and your camera is complete.

To add a professional touch, cut another section of the dowel 24" long. A discarded bicycle handle-bar grip slipped on the end will complete the effect (Photograph 7). Bore two holes in the dowel about six inches apart and with wood screws affix this guide bar to the bottom of either side (but preferably the right) of the

camera, underneath. This guide bar can then be used by the junior cameraman to turn the camera in its arc, and for moving the dolly in or out for close up and action shots. A pair of earphones can be attached to the camera, too, so that the cameraman can listen to directions from the control room.

It's time to paint your camera. Use any good grade of paint. We suggest black and aluminum. Paint the turret silver and the lenses black; the camera, pedestal and dolly black and the wheels and handle base silver. The eyepiece is black with silver to simulate the glass area. The guide bar should be silver, too, with a black rubber grip.

When paint is dry, using decal letters purchased at any hardware store, put your favorite call letters on the sides of the camera.

Turn it over to Junior (Photograph 8) and stand by for the first full-length television production ever originating in your living room or den.

THE END

End of Christmas Section

A Method for Cementing Loose Tiles

DEAN W. WALTON

IF CERAMIC tiles keep coming loose in the heavy traffic areas of your bathroom floor you can make them stay in place permanently with plastic body solder. This plastic resin type of cement is used ordinarily for patching rusted out areas in automobile bodies. It comes in two separate cans that must be mixed together in certain recommended proportions before using. When hardened, it forms a tough waterproof mass that will not crack or wear away like ordinary tile cement.

Before starting, the surface to which the solder is to be applied must be dry and free of grease and dirt. Remove the old mortar from the opening. Mix a small portion of

solder and spread a thin layer of the mixture across the bottom of the space to be retiled. Round out the corners of the hole with an excess of solder, then, holding a clean tile over the hole, position it carefully and press the tile firmly into place. The excess solder that has been forced up between the edges of the tile, can be removed at the surface with a putty knife. Wash off the tiles immediately with a rag wet with water or alcohol until all traces of solder have been cleaned from the surface. The solder hardens in about four hours or less. If you use grey body solder, it blends with the darkened color of the old tile cement and is not noticeable.



APPLY ONLY a thin layer of solder to the bottom of the opening. This permits the replaced tile to be seated flush with the surrounding ones.

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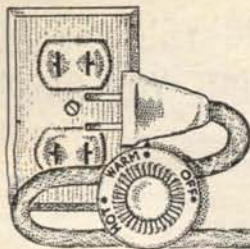
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Advice to apply to appliances

Part X—Motion Producing Appliances

J. J. LIGHTER



PHOTOGRAPH A—Pedestal type food mixer.



PHOTOGRAPH B—Portable type food mixer.



PHOTOGRAPH C—The pedestal type mixer with the parts of the juicer and grinder attachments.

A MOTION producing appliance is one designed to cause a usable motion. The other types of appliances are either heat producing or combination heat and motion producing appliances.

You might reason that power tools and even electric trains should take precedence over electric mixers, our present topic. You would, of course, be entirely correct in this assumption if common sense ruled this world instead of women. Their twisted thinking leads them to believe that they should have nonessentials like pots and pans, luxuries like irons and toasters even before the men have been able to fully equip their workshops! Please continue farther as we will eventually get to power tools in this series. The purpose now is to save you enough money to be able to afford them. You see if the mixer breaks down it must be fixed but of course if your electric drill, for example, should break down you must buy a new one while you fix the old one—to guard against any possible inconvenience!

The mixers we shall be mostly concerned with are the ordinary household variety in which an electric motor drives two beaters. The main types used are the pedestal type shown in Photograph A and the portable type shown in Photograph B. The larger type is heavier and more powerful with an assortment of available attachments for grinding, juicing, etc. While not as powerful or as versatile from the standpoint of job potential, the portable mixer is much handier for lighter work. Although they are very much the same, the pedestal type is necessarily somewhat more elaborate in several aspects that will be treated later.

Appliance repairmen know that quite often complaints are received about appliances which are not the fault of these devices at all. The only reason the appliance loses the battle is because it, even as you and I, cannot outtalk the women. The moral of the story is this: Know how the appliance operates when it is working correctly and know the proper way to use it and you will be ahead of the game. Any appliance with an assortment of attachments (commonly known as gadgets or contraptions) is in for a tough time until the lady of the house learns to use

them properly. While none of the mixer attachments are very difficult to understand they do make the maintenance problem somewhat more complex for you. A few of the additional attachments and their parts available are shown in Photograph C.

Basically a mixer's electrical circuit consists of a series wound, universal AC-DC type motor. This circuit is shown in Figure I. You will recall from previous discussions that a universal series type motor has the field coils and the armature connected in series. It will operate from either alternating current or direct current (AC or DC). In order to provide this feature it is necessary that the armature include a commutator and brushes—a frequent point for service in this type of motor. In a series motor some precaution should be taken to prevent over-speeding when the motor is not under load. Actually Figure 1 is very much oversimplified as we shall find out shortly. First, however, let us investigate various types of speed controls used on electric mixers. These speed controls must be properly understood for they are not encountered on many of the other motion producing appliances found around the house, as they are not needed. An electric mixer must operate under a variety of conditions. It is not always mixing substances of the same consistency nor is one speed recommended for all uses.

Speed Controls

A COMMON type of speed control that also incorporates a centrifugal governor is used by the mixer shown in Photograph A. In addition to allowing a speed to be selected, the mechanism also maintains this speed. This is accomplished by inserting a set of points in the electrical circuit as shown by Figure 2. Obviously when the points are open, current will not flow. It can now be seen that if the opening and closing of the points can be controlled then the motor speed can be regulated. While the device should allow automatic speed control the user of the mixer must be able to select the speed range desired. Since the points will be revolving instead of stationary they must obey the laws of centrifugal force and they can be made responsive to armature speed.

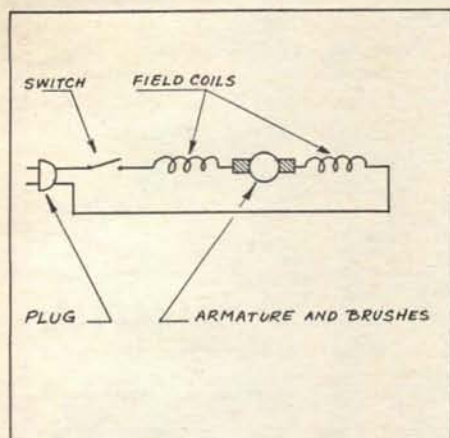


FIGURE 1—Basic series motor circuit which, with refinements, is used by the electric mixers.

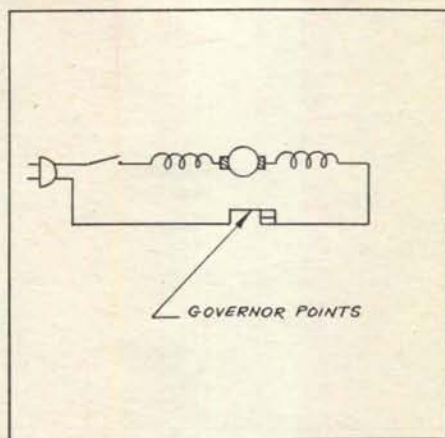


FIGURE 2—The governor points are placed in series with the motor circuit.

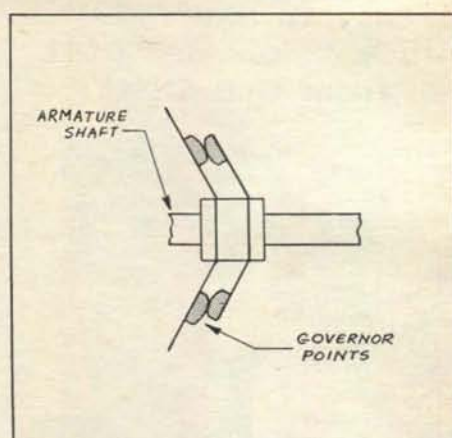


FIGURE 3—Normal position of the governor points with armature at rest.

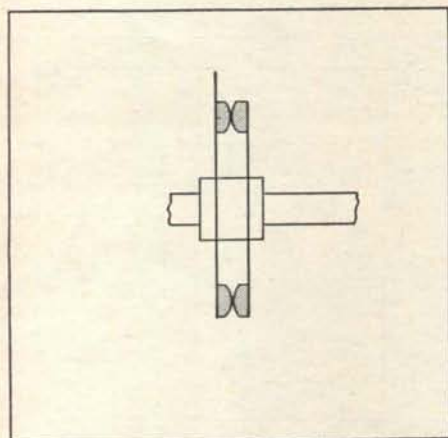


FIGURE 4—Theoretically, at high speed the points would be forced into this position by the rapidly rotating armature.

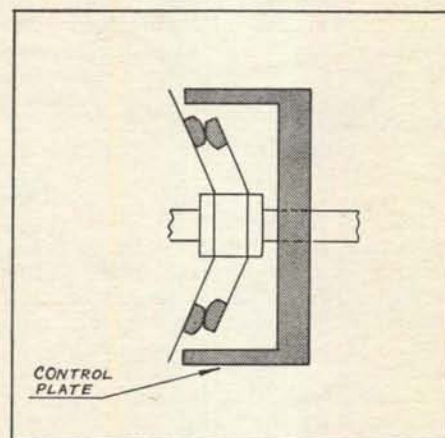


FIGURE 5—The control plate is free to move back and forth on the shaft and is controlled externally by the speed selector lever.

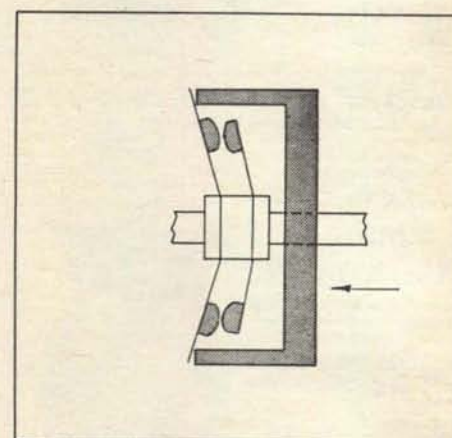


FIGURE 6—The farther the control plate is moved to the left the sooner it breaks the point circuit, resulting in a lower armature speed.

Several drawings will be used to explain this action. It is necessary to simplify the drawings for purposes of illustration. They will differ somewhat in appearance from the actual mechanism but operating principles remain the same. The points, of course, are attached to the armature shaft and therefore react to armature speed.

Figure 3 shows the position of the governor points at rest. With speed, centrifugal force tends to straighten the points as in Figure 4. Although the angle of the points with respect to the armature shaft will vary with the speed the points still remain closed.

As the armature speeds up, centrifugal force tends to make the points straighten out more and more. If the points are caused to break contact anywhere along their angle of travel the speed of the motor is thereby limited because current will cease to flow in the circuit. As the motor slows down the points will again close and the motor will speed up to the predetermined point only. This is made possible by the control plate shown in Figure 5, which slides back and forth on the armature shaft. If the control plate is moved farther to the left, the points will be forced

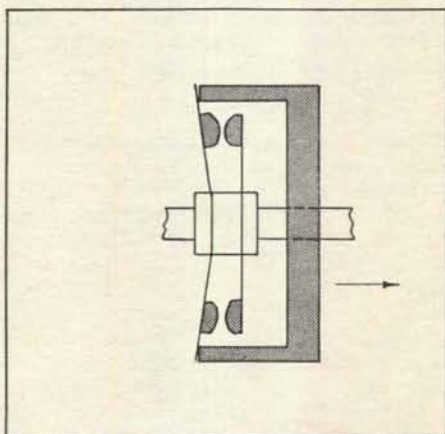
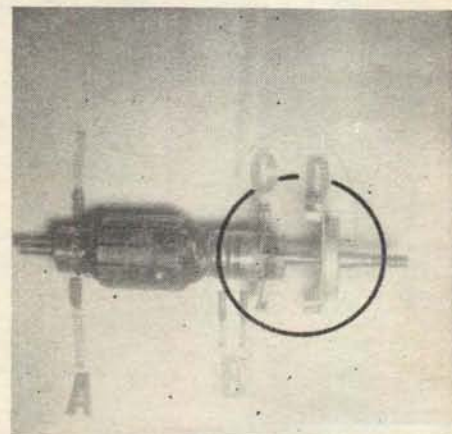


FIGURE 7—The farther the control plate is moved to the right the later it breaks the point circuit, resulting in a higher armature speed.

open at a lower speed (Figure 6). If it is moved farther to the right, the armature will pick up more speed before the points are forced to open by striking the control plate (Figure 7). The control plate is actuated by the speed selection lever. In other words, the operator of the mixer moves the outside speed selection lever and in so doing positions the control plate which in turn determines the speed at which the points



PHOTOGRAPH D—The circle encloses the centrifugal governor mechanism. The points are at "C" and the control plate at "D."

will be caused to open. The speed control and centrifugal governor are shown circled in Photograph D. The points are shown at "C" and the control plate at "D." After discussing in general the different types of speed controls we shall discuss in more detail the pedestal and the portable mixer used in these photographs as typical of the types you may desire to service.

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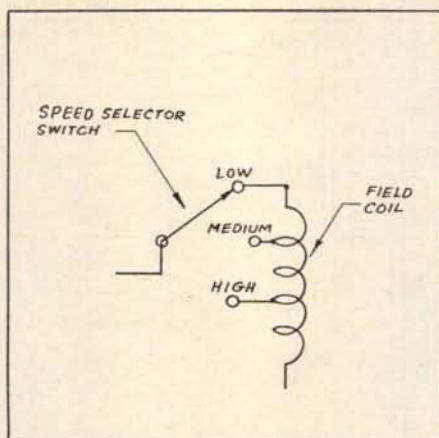


FIGURE 8—The tapped field, shown schematically above, is one method of speed control used on mixers.

ANOTHER MEANS of controlling the speed of series motors is the tapped field method. This is used on some mixers and is used on the portable mixer shown in this article. It is less complicated because it depends upon the operator to select the desired speed and does not have the automatic features of the centrifugal governor type. Figure 8 shows what is meant by a tapped field. Leads are connected from various points on one of the field coils to contacts on a rotary speed control switch. Speed control is affected by putting either more or less of the field coil into the circuit. With the switch on "low" all of the coil is used and there is maximum resistance and minimum current flow in the motor circuit, resulting in the slowest speed. On "medium" less of the coil is used, resistance in the circuit is less and current flow is greater, resulting in greater motor speed. The high position uses even less of the field coil, resistance is further reduced and current increased, giving the motor its maximum speed. This system is practical only within certain limits because obviously one could not keep on reducing the use of the field coil to the point at which the field coils were not being used at all and at this point have maximum motor speed because of minimum resistance! This reasoning would be much like that of the fleet-footed squirrel who practiced running back and forth in a long hollow log. Each time he reached the end he would stick his head out, turn around and start for the other end of the log. He began to get so fast at this that he soon reasoned that it wouldn't be very long before he could stick his head out of both ends of the hollow log at the same time. Moral: Sometimes reasoning isn't reasonable.

One of the earlier methods of controlling food mixers was the adjustable brush method. For maximum power the brushes must be ideally located with respect to the commutator. If they are shifted from this

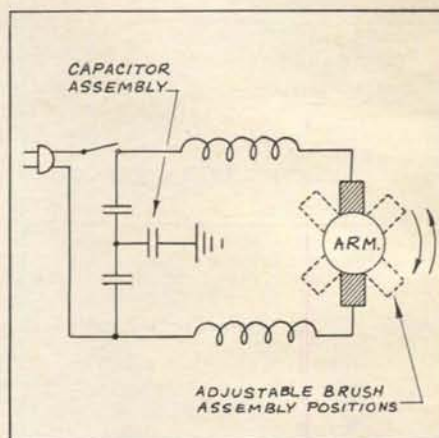


FIGURE 9—Speed of the mixer motor using this type of circuit is varied by means of a movable brush assembly.

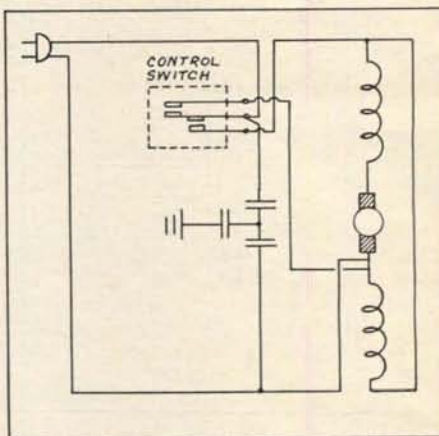


FIGURE 10—One arrangement for a two-speed electric mixer.

ideal location the operation of the motor responds accordingly. Slower speed and correspondingly less power can be selected in this type of mixer by simply shifting the brushes to a more inefficient position. By shifting the brushes to the most efficient position maximum speed and power can be obtained. The external speed selection lever, then, controls a movable brush assembly free to rotate a certain number of degrees around the circumference of the commutator. Figure 9 is a wiring diagram of this type of mixer. A capacitor (condenser) assembly is shown connected across the line in the drawing. While not always present, this arrangement is usually used to help reduce interference with radio and TV sets.

Figure 10 is a schematic diagram of a popular two-speed electric mixer. When the slowest speed is selected the top set of contacts are closed causing current to flow through the series connected field coils and the armature. When the highest speed is selected the lower set of points are closed and current flows through the top field coil and the armature. Greater speed is obtained because the resistance of one field

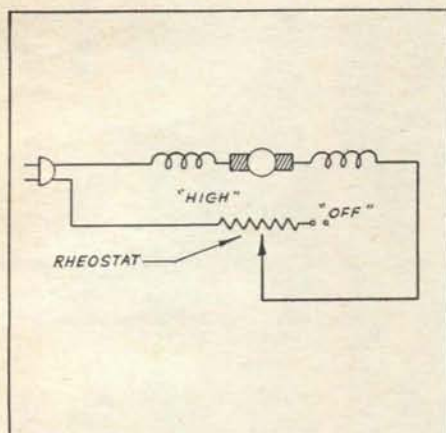


FIGURE 11—In this circuit a rheostat is used to control the current in the circuit and therefore the speed.

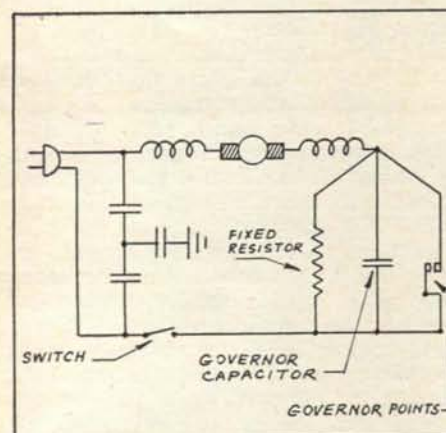


FIGURE 12—This is a schematic drawing of the pedestal type mixer shown in this article.

coil has been eliminated from the circuit, resulting in a higher current flow.

Another type of mixer speed control exists that should be called to your attention. This type uses a rheostat (variable resistor) to control the current flow in the circuit and therefore the speed of the motor. Figure 11 is a simplified drawing of this circuit. In actual use the addition of other units would probably be added to insure proper starting characteristics, etc.

Pedestal Type Mixers

BY PEDESTAL type mixers we mean the heavier types designed for use in one place, the type shown in Photograph A. Both the pedestal and the portable mixer shown in this article were made by the same manufacturer so a good comparison is possible of their likenesses and differences.

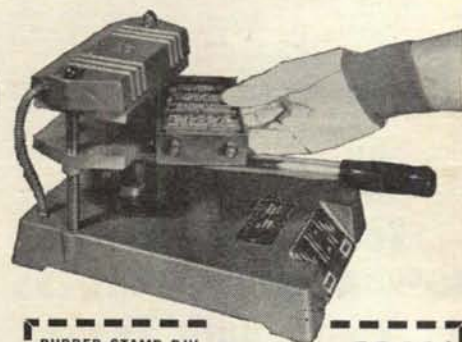
A schematic of the complete electrical circuit of our pedestal type mixer is shown in Figure 12. A motor capacitor assembly is connected across the line to reduce radio and TV interference. Another capacitor is in parallel with the governor points; it helps eliminate arcing at the points and therefore also helps reduce radio and TV interference. Removing the bottom plate from the

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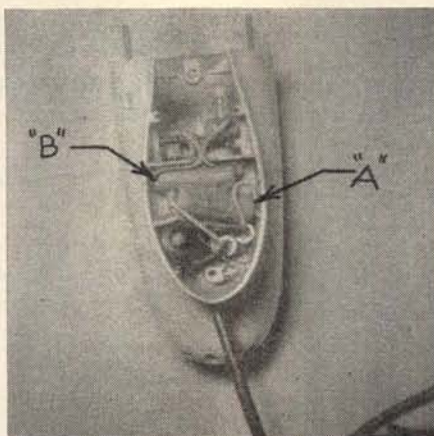
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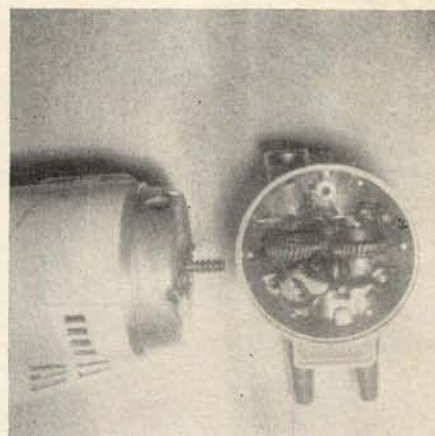


PHOTOGRAPH E—"A" is the motor capacitor and "B" is the governor capacitor (pedestal mixer).

mixer exposes the junction box which also houses these capacitors. The motor capacitor is shown at "A" in Photograph E and the capacitor for the governor points is shown at "B." The former has three leads since one of them goes to ground while the latter has only two.

For smooth operation it is necessary that the current in the motor circuit is not completely stopped when the governor points open. This is made possible by placing a fixed resistor in parallel with the points. Thus, as long as the switch is closed a small amount of current continues to flow even with the governor points open. If this resistor should burn out, the operation of the mixer will be very jerky. You might tend to think that this would be the case anyway with the opening and closing of the governor points. Actually the points open and close so fast that the result is proper speed control along with smooth operation. If you find this difficult to believe, remember that the alternating current in your home reverses direction 120 times a second but you see the light of an electric bulb as a steady effect rather than blinking on and off constantly.

Usually the handle of the mixer must be removed before anything else. After removing the handle take off the gear case. Photograph F shows the mixer with the gear case removed exposing the worm gear on the armature shaft and the gears which drive the spindles. Be careful not to destroy the gasket in removing the gear case. It is necessary that there be a tight seal between the gear case and the motor so that the grease does not leak into the motor. It is also necessary that no grease leaks to the outside, of course. While oil is needed at the bearings, any excess oil or grease inside the motor can be very damaging especially in this type of motor. This is true because in addition to the regular commutator and brushes at one end of the armature a collector ring and brush assembly is necessary for gov-

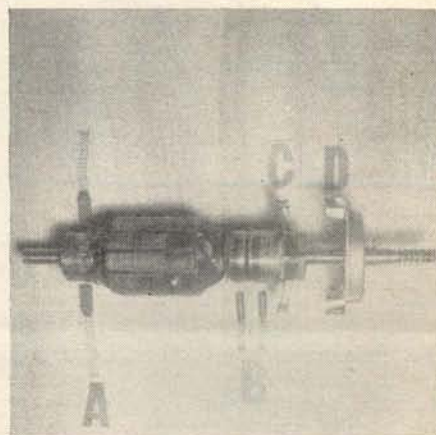


PHOTOGRAPH F—Pedestal type mixer with the gear case removed.

ernor operation.

It may be seen from the relatively large size of the gears that the motor's armature turns over much faster than the spindles. This reduction in speed imparts greater torque (turning effort) to the spindles. The gear case must be adequately supplied with the proper grease that will not thin under operating conditions and leak out or into the motor. Once the gear case is removed the nuts holding the motor itself are exposed and it may be disassembled.

Photograph G shows the armature assembly. At "A" are the square brushes and their springs; these are the brushes which ride on the commutator. At "B" are the round brushes, and their springs, that ride on the collector rings. "C" of course is the centrifugal governor point assembly and "D" is the control plate. An uninformed person might be understandably confused by the second set of brushes. Brushes of some type, however, are needed when current is to be transferred from a rotating member of the electrical circuit to a stationary point in the circuit—as is the case with the centrifugal governor. This can probably be better understood by studying Figure 13. It may be seen that one brush rides on



PHOTOGRAPH G—The armature, brush, and governor assemblies of the pedestal type mixer.

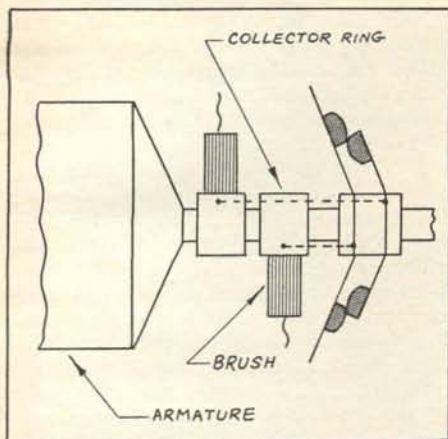
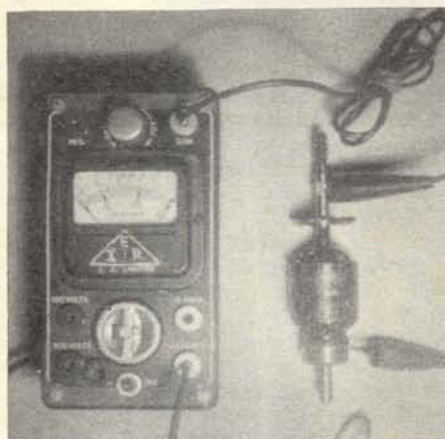


FIGURE 13—One half of the governor points is connected to one collector ring and the other half to the other collector ring.



PHOTOGRAPH H—Checking the armature for a ground with the leakage indicator section of the utility tester.

only one ring and that each set of points is connected to one of the rings. Since all of you **Workbenchers** should be old hands at commutator servicing (we have gone into the subject several times in past issues), we shall spare you that again. The collector rings, or slip rings as they may be called, can be cleaned in the same way as the commutator. That is, by wrapping a strip of a fine abrasive material around the rings and turning the armature back and forth.

Photograph H shows the utility tester being used to check for a grounded armature. In this test one test lead is plugged into "COM." (common) and the other into "LEAK-AGE"; the meter itself is plugged into an electrical outlet. The test clip is attached to the armature shaft and the test prod to the commutator; if the neon bulb lights then the armature is said to be grounded. A ground is said to exist if an electrical connection exists between the normal electrical circuit and a portion of the metal in the device which is not supposed to be a part of the electrical circuit. Besides possibly causing faulty operation, a grounded appliance can inflict an electric shock.

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PHOTOGRAPH I—Checking for a ground without disassembling the mixer. This test is valid only if there are no parallel connected units such as capacitors in the circuit which would give continuity to ground.

It can sometimes be determined whether or not a grounded condition exists without disassembling the appliance if the internal circuit is known. Such a hookup is shown in Photograph I with the test prod touching the beaters (not part of the electrical circuit) and the clip attached to one of the prongs on the plug. Horrors, the neon bulb glows! That would be a correct assumption for a non-Workbencher but an incorrect diagnosis for you. In rechecking Figure 12 you will remember that a capacitor assembly is used and that one of the leads is grounded. Since a capacitor will not block AC in a circuit (as it will DC) continuity is shown in this instance because the leakage indicator is connected to an AC outlet. On a mixer not using the capacitor assembly (such as our portable one) this would be an entirely valid test though.

I have mentioned before that commercial testers as well as homemade testers should be handled with the care and respect expected of any craftsman. I have also mentioned that some utility testers, including the one shown as well as certain homemade testers, if used improperly and under certain conditions, could be expected to give you a shock. This could happen any time that the unbroken lead of the tester was connected to the "hot" side of an electrical outlet if you happened to touch a test prod while your body was also in contact with a good ground (such as a stove or water pipe).

It so happens that a skeptical acquaintance of mine believed he had a utility tester of which this was not true. It also happens that he has (or had) the very bad habit of using the large work space on his wife's electrical stove for his electrical tinkering. Being a major 220-volt appliance, this stove is very well grounded—as is required. One night he plugged in his tester intending to check an ap-

pliance for leakage when he accidentally dropped one of the test leads on an exposed portion of the stove. The sparks flew, the lights went out, and the mad scientist blew a fuse—in more ways than one, but he is now a believer. Incidentally a voltmeter check between each of the sides of an electrical outlet and a ground will, by virtue of its reading, indicate which is the "hot side" of an outlet. A small dab of paint or other marking will then forever remove any doubt about which is the hot side. This check is shown in Figure 14.

Photograph J shows the end view of the pedestal type mixer motor case. When the handle is removed, as it is here, a large screw and lock nut is exposed. This screw is adjustable in order to adjust the amount of end play in the armature shaft. It is not necessary to remove this screw on this model to take the armature out. The commutator end of the armature shaft contains a spring-loaded steel ball which rests against this screw. If the screw is too loose the armature will have too much play; if it is too tight the shaft will bind and the motor will not run as fast.

Photograph I also shows a desirable feature in pedestal mixers. By turning the bowl control lever the bowl table (which also is free to rotate) may set off-center from the beaters. Thus the beaters can be positioned closer or farther away from the sides of the bowl as may be required. This pedestal mixer may be slipped off its stand and moved about giving it a certain amount of portable use. The chief detriment to this is its considerable weight if it is to be held long.

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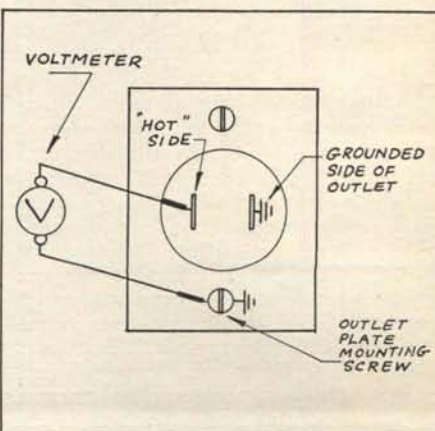


FIGURE 14—The voltmeter will indicate outlet voltage when connected to the hot side of the circuit and a ground. When metal mounting screws are used for the cover plate they will ordinarily furnish a ground.

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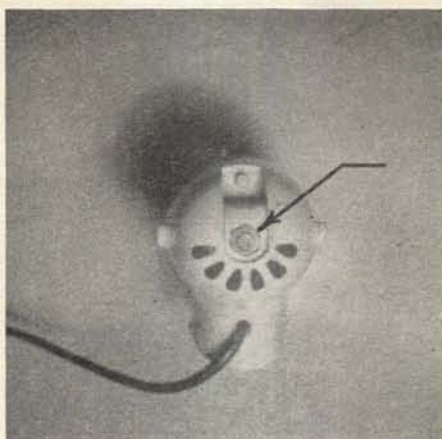
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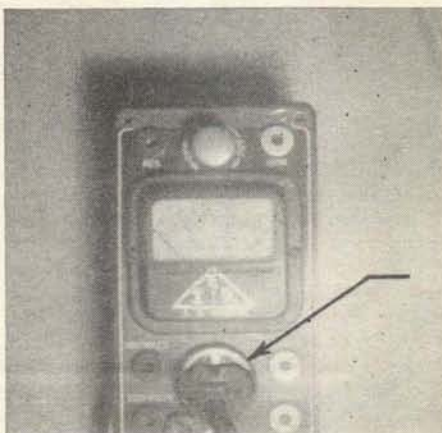
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PHOTOGRAPH J—End view of the pedestal type mixer showing the screw and lock nut for taking up end play in the armature shaft.

be about half as powerful, then, as the pedestal type. The current draw in either case is so small that the utility tester is not sensitive enough to record the difference. Photograph K shows a closeup of the plug-in ammeter feature of the utility tester being used to check the current flow or current draw (in amperes). The tester is plugged into a 110-volt outlet and the appliance is then plugged into the tester. On meters of this type the comparatively small amount of current in the mixer circuit (at most slightly more than one amp) will barely be noticeable.

This particular portable mixer does not have a governor, uses no capacitors, and has a tapped field type of speed control. A schematic of its electrical circuit is shown in Figure 15. You will notice that there are four stationary contact points on the rotary switch. One of these is not connected to the field coil at all; this is the "off" position. Photograph L shows an end view of the portable mixer motor case with the armature removed. The four contacts previously mentioned may be seen in the upper right. Below this is the rotating member of the rotary switch. The



PHOTOGRAPH K—A close-up of the plug-in feature for the ammeter section of the utility tester. Because of the low current flow in the mixer circuit the meter may seem not to indicate.

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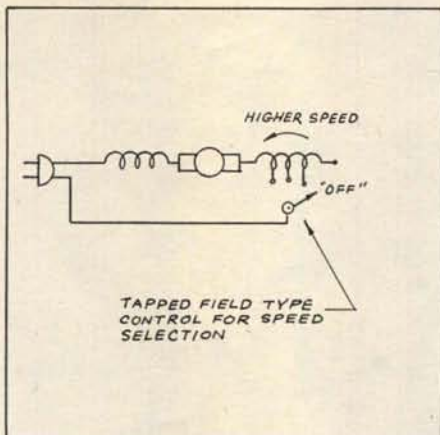
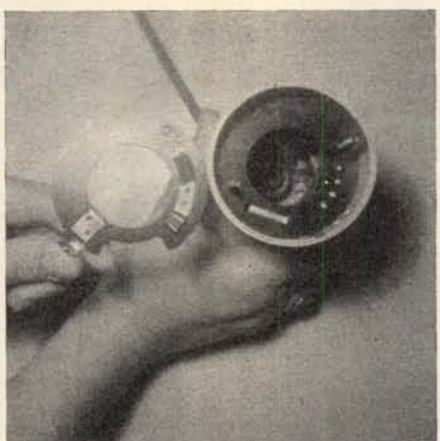


FIGURE 15—This is a schematic drawing of the electrical circuit in the portable type mixer displayed in this article.



PHOTOGRAPH L—Our portable mixer uses a tapped field type of speed control. The switch and the various connections are shown in this end view of the mixer.

speed selector lever (next to the holder's thumb) extends to the outside for selecting either off, low, medium, or high speeds. These are designated as "Off," "1," "2," "3."

The armature being tested in Photograph H is the armature for the portable mixer. Notice that there is no speed control or governor mechanism used. There is, however, a fan which was not found on the larger armature. Due to its compact design this fan is needed on the portable type to assist in cooling.

General Repair Information

DISASSEMBLY OF the average mixer is not difficult nor does it usually require any special tools. Be observant so that you know just how everything comes apart, including the placement of washers which sometimes stick to bearings or the armature shaft. Lay the larger parts out in the order of disassembly. Put the smaller parts in a dish or container where they will not likely be lost or damaged. Be careful of sealing gaskets such as the one under the gear case as they are easily destroyed.

Marking, for example, the gear case and the motor case before taking them apart is a good habit to form.

It would be very nearly impossible to put the mixers shown back together incorrectly or out of alignment because the gear case of each fits perfectly on the motor case of each only one way. Use proper size screwdrivers so that you don't chew up the screwheads. If a Phillips head screw is used don't substitute your own invention. Oftentimes a workman will put something together in great haste and with little care on the theory that he will never have to take it apart again. Unfortunately he may find that he has made a mistake and must immediately take it apart and therefore is a victim of his own methods.

Check for oil holes and keep them clear. A few drops of oil occasionally will help prevent bearing trouble. Too much oil may leak to the outside again or inside of the motor and cause smoking as well as a burned and pitted commutator or collector rings. The ventilation holes, you will notice, are on the bottom of the mixers or at the back. Food particles do sometimes get into the motor and the heat may cause them to burn and smoke or smell. This difficulty is sometimes wrongly assumed to be a burning motor.

In both of the mixers shown the brushes are easily removed without disassembling the motor as the brush caps are located on the outside of the motor case. In reinstalling brushes fit the contour of the brush to the commutator or collector ring as nearly as possible. This is more difficult to be sure of on round brushes than on square ones. Do not get oil or grease on the brushes as it is detrimental to them and to the commutation process.

ONE VERY important point that is easily overlooked is that of realigning the spindles so that the beaters mesh correctly (Figure 16). It is possible, and more than likely, that if you install the gear case without checking the beaters will clang and bang or even bend out of shape when you

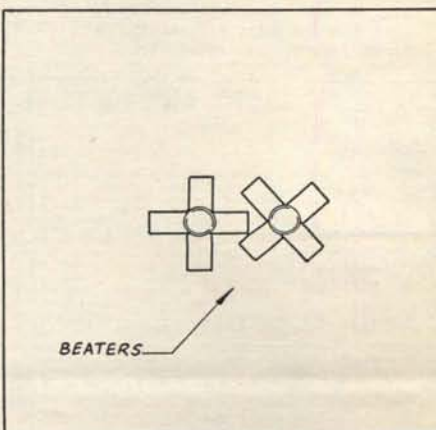


FIGURE 16—Bottom view of the beaters showing what is meant by "meshing them properly." A perfect mesh may be impossible and you will have some tolerance.

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wife uses the mixer for the first time. Unless it is a new mixer this is probably just what she is hoping for, especially if she is looking for new argument material. The best procedure is to install the beaters and then fit the gear case onto the motor case. Try to hold the beaters the way they should be as you position the gear case. When the worm gear meshes with the spindle gears it may move the beaters relative to each other so that you will have to try again. If you are not sure, fasten the gear case on lightly with one screw and turn the switch on, then off quickly. If the beaters still do not mesh correctly because the spindles are not lined up you will soon know it! Operate only for a fraction of a turn until you are sure that you have lined them up correctly.

Good mixers cost money and are well engineered. If you have any parts left over—well shame on you! You may rest assured that the manufacturer did not include in his appliance anything that he thought was not essential. Careful observation in disassembly and equal care in storing parts and in reassembly should net only the best of results.

If oil has been added to the proper places and the gear case packed with grease you should never have the complaints associated with 'frozen' parts. Due to lack of lubrication parts often run dry, bind, overheat and eventually seize. This can cause anything from slow operation to no operation.

If the mixer does not operate or even hum or buzz and you have checked the outlet and found that the proper voltage was present, you should systematically check the electrical circuit of the mixer until the difficulty is found. Do not overlook the possibility that the plug is not making good contact in the outlet. Chances are that an open exists in the circuit. A short would cause a fuse to blow and a ground might give you a shock, blow a fuse, or allow the mixer to operate normally depending upon conditions.

In checking for an open you would probably want to use the leakage indicator or possibly the ohmmeter. Some prefer to fasten one lead to a point on the circuit under check and move the test prod until a point is located where there is no continuity. Others prefer to place a different section of the circuit each time between the leads seeking a section with no continuity. There are a few fundamentals that must be remembered if you are to be successful in trouble shooting. Parallel units must be isolated from one another. If, for example, a set of governor points has a resistor in parallel with them continuity will be indicated even if the points are held open. Since a capacitor will pass the AC, if the leakage indicator is being used for the check, the capacitor connected in parallel with the points will also cause con-

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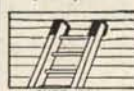
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tinuity to be indicated regardless of the points. The position of the switch must also be taken into consideration in these checks as must the capacitor assembly connected across the line—if one is used.

A defective governor and/or switch might be responsible for erratic speed, loss of power, or vibration. On tapped field types the mixer may not run on all speeds due to a faulty connection. A shorted governor capacitor will cause high speed operation because the governor will then be totally by-passed. The same will be true if governor points become welded together.

Various mechanical defects may cause faulty operation. Lack of lubrication can cause binding and slow operation, as can bad bearings. Broken teeth on the spindle gears cause erratic or in some cases no beater operation. Sometimes beaters are dropped and bent and the mixer is blamed for poor operation. The fact that beaters are hard to install or remove is a frequent complaint usually traced to nonmechanically inclined housewives. Sometimes rust or foreign matter may be responsible for this, however. Grease leakage is usually due to improper grease being used or a bad gasket. If the gear or motor case becomes bent it may be impossible to effect a perfect seal again.

PARTS, BOTH mechanical and electrical, will sometimes have to be replaced in the course of mixer repair. When buying parts it is always helpful to have as much information as possible available so that your supplier will have no doubt as to exactly what you desire. Model number, manufacturer, wattage rating, and similar information is listed on the name plate of the appliance. Operating instructions that come with the appliance sometimes contain diagrams and a parts list. If you are going to buy the part from a local repairman it is a good idea to take the old part along so a comparison can be made. There may be times when it is inconvenient or impossible to get what you want in the area and you will want to write to the manufacturer. The manufacturer will probably refer your order to the nearest factory authorized repair station or parts distributor.

The principal reason for electrical trouble shooting is to find out the cause of some malfunction. Once you determine the cause you will have to know what corrective measures to take. This means deciding whether the part can be repaired or if it must be replaced. It is usually impractical—if not impossible—to repair some portions of the electrical circuit. Among these are internal opens, shorts, and grounds in the field coils or in the armature windings. It is true, however, that a grounded field may involve only an outside winding that may be repaired

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with electrical tape. Or, for another example, an armature winding may become unsoldered at the commutator. In the case of these and similar rare exceptions you can make a repair.

Switches become defective and will either not close the circuit or not open it—and they must be replaced. Open or shorted capacitors must be replaced. Sometimes performance is improved by cleaning control surfaces with a very fine abrasive cloth—for example tapped field contacts. If governor points are more than slightly burned or pitted they should be replaced to prevent upsetting the speed settings as might occur if much work had to be done on them. Normally they should remain in good condition for a considerable period of use unless the capacitor that protects them becomes open and therefore ineffective. For purposes of comparison consider the breaker points in the distributor of your automobile. If their protective capacitor (condenser) becomes open, things will get worse in a big hurry!

Although it can be repaired, replacement of the line cord of the appliance is recommended if an open or short is found or even if it becomes worn or frayed. Internal connections sometimes work loose; they should be good both physically and electrically. Opens in a mixer's inside connecting wires (field leads, etc.) can sometimes be repaired by twisting the wires together, soldering and then taping. Plastic electrical tape is very good for this. In soldering use rosin core solder only—acid flux solders will later destroy the connection. If the broken lead is not long enough to be repaired as described above, a new piece may have to be spliced in.

A wire may rub against the frame of the appliance for long enough to break through its insulation and create a ground. The aforementioned tape will correct this malady.

USUALLY CORK gaskets are meant to be replaced each time the appliance

is disassembled, which is a good practice. If parts are too hard to get, careful handling may allow them to be used more than once. The biggest mechanical enemy of portable appliances is dropping. Broken handles, cracked frames and cases usually cannot be repaired satisfactorily and must be replaced. Beaters usually can be straightened. The close tolerance between the armature and the field poles places the odds of properly straightening a bent armature shaft against you. If the armature is dropped and the cooling fan bent this can be straightened. Turn the armature several times while closely checking the alignment of the blades one against the other as a test on your repair.

To describe the possibilities of each individual corrective action would take more pages than we have available. Exclusive of the information listed here it is up to the individual WORKBENCHER to exercise his own ingenuity to meet the particular situation which confronts him. If you can't repair—then replace. If you can repair give some reflective thought to the best way, the most lasting way, to repair the item.

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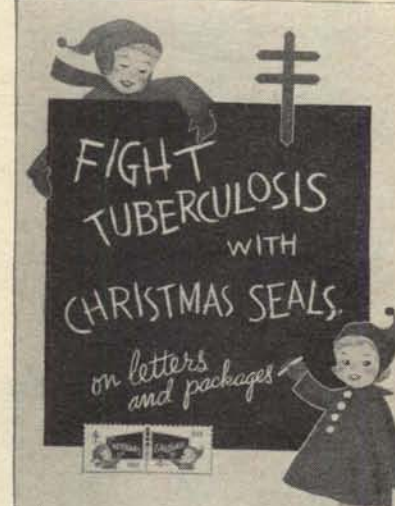
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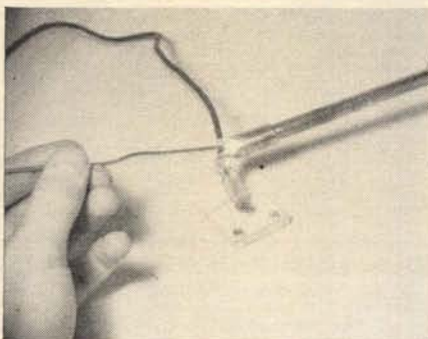
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14320

This Might Help

Handy Soldering Vise

If you find it difficult holding small parts while soldering them, you will fully appreciate the usefulness of a soldering vise. You can quickly and easily make one from a small battery clip or test clip (available at most hardware and electrical stores), a

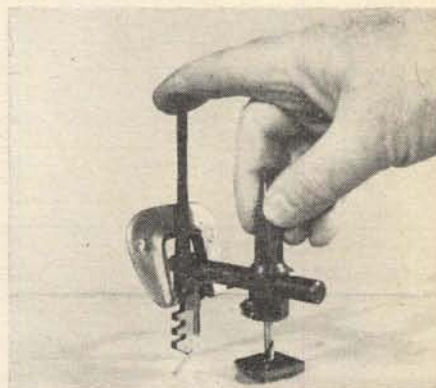


piece of plastic or hardwood about 1/2" x 2" x 2", a short machine screw and nut, and two small wood screws. Remove the wire mounting screw at the rear of the clip, drill the hole a bit larger to accept the machine screw. Drill three holes in the plastic or wood base in the approximate positions shown in the photograph. Then, using a larger drill, counter-sink the underside of the clip mounting hole to receive the nut. Mount the clip on the base with the machine screw by placing it through the clip and mounting hole in the base. Tighten the screw, and bend the clip up slightly at an angle. Fasten the vise in a convenient location on your bench top by driving the wood screws through the two remaining holes in the vise base.—John A. Comstock

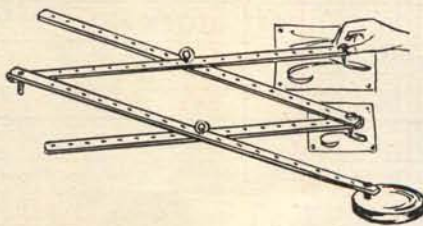
Wood Cutter Adapted to Glass

A circle cutter intended for cutting holes in wood can be adapted to cut glass also. All you need do is attach an ordinary glass cutter to the steel bit, using a "C" clamp having 1" or larger jaws. Although the circle cutter is intended for use with a drill press or power drill, when cutting glass it is best turned by hand. Rest the center drill on a small piece of hardboard. If the hardboard should slip, a drop of rubber cement will hold it in place.

Ken Murray



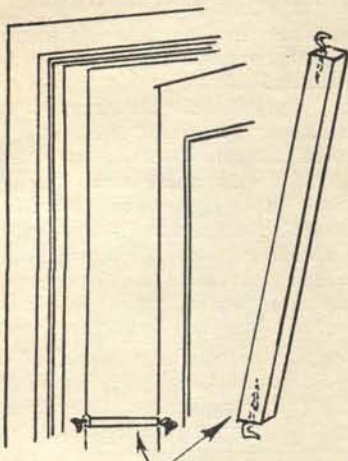
Weight Your Pantograph



Pantograph users will agree that the stationary point is not the best means of holding the pantograph in place. Either you do not have a large surface that you want to tie up just for this purpose or you do not care to drive nails or screw screws into the smooth wood tops that may be available. If a weighted point is sub-

stituted for the fastened down type mount you will find that your pantographs will be much more convenient and easier to use. If you aren't lucky enough to have a piece of junk that you can convert into a weight, go to your local machine shop and get a "cutoff" piece that you can use. Drill and tap a 1/4" hole about 1/2" deep near the edge of this weight. Insert a 1/4" x 1" stove bolt into this hole. Cut off the head. The pantograph is now placed over this point. The pantograph can now be used on such surfaces as tile floors, porcelain table tops, card tables, etc., surface on which it would be impossible to mount the stationary point of the pantograph if it were in its original state.—Arthur R. Tanner, Jr.

Storm Door Latch-Bar



Wood Latch Bar 24"x 1/4" x 1/4"

Usually storm doors are heavy and hard to handle but there are many times during the winter months when it is desirable to keep one or more partly open. To permit this, make a wooden latch-bar to hold the door fast. It is no more than a stout hardwood piece 1/4" x 1/4" with a screw eye or hook firmly fixed in each end; one engages a hook in the door, the other a hook in the frame, or vice versa. The length must be determined carefully in advance so as to get the most useful size of door opening. If the first one proves too long, providing too wide an opening, it can be shortened readily. But it can not be lengthened—if the first one proves too short you must make a second, longer one. Hardwood is necessary to hold the screw in the end grain.

Morris A. Hall

Tape Aids Plastic Marking

Working with a piece of scrap plastic that has no paper backing, makes it difficult to see pencil marks on plastic where you want to cut or drill. Try covering the surface with adhesive tape and make your markings on the tape. This will enable you to see your pencil lines clearly making it easier to cut or drill the piece of plastic. When finished cutting or drilling the piece, simply peel off the tape.

Incidentally, when using adhesive tape on many surfaces adhesive markings will often remain on surface when tape is removed. To clean surface of adhesive quickly, simply rub petroleum jelly over the adhesive and allow jelly to remain on surface a few minutes. Then using a cloth saturated with rubbing alcohol, wipe the surface clean.

Donald Spichuk

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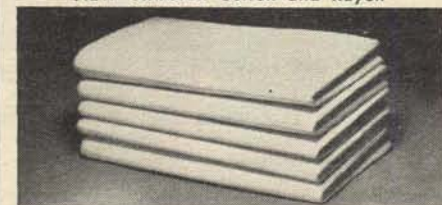
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With these trans-parent plastic bags, which keep garments clean, dust-free, you SEE the clothes you want QUICKLY! Contour shaped to fit hangers, FULL SIZE! 12 Suit Bags 40x21x4" or 8 Dress Bags 40x21x4"—only \$1.00 per set plus 10c postage.

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FREE BOX 500 Gummed Labels printed with any name and address only 50c. Plastic jewel-type box FREE with each set ordered! Stick on letters, envelopes, packages, etc. Special 3 sets \$1.00. Same or different name on each set.

CLOSEOUT ITEMS!

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Plastic Mixer Cover Was 50c.....Now 29c ea.
Sugar Scoops Were 15c.....Now 5c ea.
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Baby Dolls Were 25c.....Now 3 for 25c
Jewelry Silver & Polish Cloth Was 70c.....Now 39c ea.
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French Fries Cutter Was \$1.00.....Now 49c ea.
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Miniature Bible Protestant or Catholic Was 25c.....Now 3 for 25c
Cute Pie Children's Apron Was 75c.....Now 39c ea.
Pretty Plastic Tea Apron Was 29c.....Now 9c ea.
Pocket Protector Was 25c.....Now 3 for 25c

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CLOGGED SEWER Remember The COSTLY PLUMBING BILL —



CHICAGO—Nov. 1st. Just introduced is a Free Booklet on a New Discovery which enables the Home Owner, Janitor, or Factory Maintenance to clean any Clogged Sewer Drain. Yet anyone can operate this new Plumbers Flushing Gun which releases air pressure on a solid shaft of water cleaning the most stubborn stoppages up to 300 ft. TOILETS, SINKS, URINALS, BATHTUBS, FLOOR DRAINS and HOUSE-TO-STREET SEWERS clogged with Grease, Rags, Sand, Roots, and paper melt away instantly when struck by the Hammer-like blow of this new unit.

There is no need to remove wall or pipe, or Grease Trap. A special attachment allows water to flow from the faucet through the Gun while air is released on the pipe. Vents or stacks are no obstacle as force tends to strike wherever the water lays. But now, what is this Plumbers Flushing Gun worth in COSTLY PLUMBING BILLS SAVED? Tear this Ad out—write your name and address beside it for FREE BOOKLET. Obey that urge. No agent will call. A postcard will call. (Midwest Office: 343 S. Dearborn St., Chicago, Ill.)

do (Chicago Phone Kildare 3-1702), MILLER SEWER ROD DEPT. WS-N, 4640 N. Central Ave., Chicago 30, Illinois

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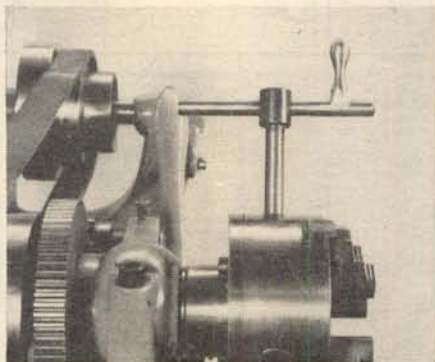
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TRANS PLANS, Dept. P39

29 Holly St. Yonkers, N. Y.

This Might Help

Crank Handle Brazed on Chuck Wrench



Opening and closing the jaws of a lathe chuck can be made a speedy operation by the addition of a simple crank handle. The crank in the illustration was brazed in place near one end of the standard "T" chuck wrench.—H. J. Gerber

Steel Wool Renews Screw's "Bite"

When screws no longer "bite" in wood or plaster holes which have become too large, roll a small amount of steel wool into a long and narrow wad and force it into the hole with a pencil. The screw will turn into the steel wool and take a firm grip.

Charles V. Mathis

Pre-Color Window Putty

The next time you have to reglaze a window sash here is an easy way to save time and trouble in having to paint the newly puttied area. Before applying the putty, merely add a sufficient amount of the colored paint desired, knead it well into the putty, to obtain the right consistency. Then, when you putty the windows, you have already finished the job of painting the areas. If, in mixing the paint with the putty, you notice that the paint is making the putty sticky, merely add a little powdered whiting and work into the paint and putty combination.

M. Robert Beasley

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How to Enlarge Squared Patterns and Designs

Number the outside squares of the pattern both horizontally and vertically. Now, using a piece of paper (preferably tracing paper) sufficiently large for the full-sized pattern, measure off the exact area you wish the pattern to occupy. Divide this area into the same number of squares as appears in the smaller pattern. Number the outside squares on the paper in the same manner as you have numbered the original pattern.

Copy carefully into each of the large squares the portion of the design that appears in each correspondingly numbered square of the original pattern.

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Sell nationally advertised tools to your friends and neighbors. Also for your own industrial and institutional use. New giant wholesale catalog has room for only your name on it. You get all the orders and re-orders. A MILLION DOLLAR INVENTORY AT YOUR FINGERTIPS. NO STOCK TO CARRY. ORDER AS YOU NEED IT!... Stanley, Clemson, Diss-ton, K. & E. Lufkin, Miller Falls, Wiss, S&K, Thor and many other name brand tools, appliances, electric tools, power tools and others, too numerous to mention. WHOLESALE DISCOUNTS UP TO 50% off... Send \$1 deposit and get the new giant wholesale catalog. Your \$1 is credited to your first purchase or refunded if not 100% satisfied. Write NOW!

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How to pass a genius

All of us can't be geniuses. But any ordinarily talented mortal can be a success—and that's more than some geniuses are.

Now, as in Esop's time, the race doesn't always go to the one who potentially is the swiftest. The trained man has no trouble in passing the genius who hasn't improved his talents.

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Mark your special interest on the coupon. Don't be like the unsuccessful genius who wastes his life in dreaming of what he intends to do. Act now!

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Without cost or obligation, send me "HOW TO SUCCEED" and the opportunity booklet about the field BEFORE which I have marked X (plus sample lesson):

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| <input type="checkbox"/> Reading Arch. Blueprints | <input type="checkbox"/> Industrial Supervision |
| <input type="checkbox"/> Architectural Drafting | <input type="checkbox"/> Reading Shop Blueprints |
| <input type="checkbox"/> Mechanical Drafting | <input type="checkbox"/> Tool Design |
| <input type="checkbox"/> Practical Electrician | <input type="checkbox"/> Automobiles |

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- \$1 Chlorophyl Tablets, 7½c pkg.
- 15c Textile dyes, 3½c pkg.
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- POSTAL SCALES, 7½c each!
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- PENCILS, 144 for 57½c!
- 69c Insect Repellent, 5c each!
- CHRISTMAS SEALS, 25c per 1000!
- ENVELOPES, 50c per 1000!
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- \$1.75 Rudolph kids toiletry sets, 35c.
- NEW HAIRNETS, ½c each!
- \$1 Automatic Card Shufflers, 9c each.
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- 25 card asst. Xmas cards, 11c box!
- 50c Everyday greeting cards, 7½c box!
- \$200 Govt. Surplus Typewriters, \$23.
- \$1-\$3 Hard covered books, 20c each!
- 49c Xmas window decorations, 10c per set.
- Famous Brand \$18.75 Perfume, \$1.
- 69c Insect Repellent, 5c each.
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- CIGARETTE HOLDERS, 1c each.
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- \$1 Val. Billfolds, 15c each.
- \$2.50 Wallets, 30c each.
- LADIES APRONS, 6¼c each.
- D.E. Razor Blades, \$1.50 per 1000 blades.
- \$1 Mufflers, Scarfs, 12½c each.
- Plastic Toy Guns, 2c each.
- 25c Rudolph Reindeer brooches, 2c each.
- \$15 Electric Percolators, \$5 each!

(Above bargain list merely illustrates type of Bargains usually found in this paper. Lists Naturally change from month to month.)

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ONE issue of this SENSATIONAL Publication can make or save you MORE MONEY than the COST OF THE ENTIRE SUBSCRIPTION! This is the ONLY Big National paper of this type in circulation! You'll be AMAZED, FLABBERGASTED and DELIGHTED at the wonderful listings in every issue!

Look What Subscribers Are Saying!

Toys, Books, Jewelry, Greeting Cards, Cosmetics, Household Merchandise, Appliances, Industrial Materials, Machinery, Tools, etc.

Here's What Subscribers say about "Bargains" After Receiving Their first copies!

"... Your book BARGAINS is just wonderful and I am very glad I subscribed to it." — H. K., Port Monmouth, N. J.
 "... As a result of answering one of the ads (in Bargains) it has resulted in extra profits of \$40.00 and upwards per month." — J. H., Alabama.
 "... Saw your wonderful paper and enjoyed every bit of its reading and adv. It's a Great Paper." — M. S., Vermont.
 "... I am very pleased with BARGAINS. I have never seen anything like it and am looking forward to my future copies especially the Christmas edition." — Mrs. D. M., Maine.
 "... Received my first issue of Bargains and may I say it is a great magazine." — M. H. C., Alabama.
 "... I think BARGAINS is the best merchandise publication I have ever seen (And I have seen hundreds)." — S. P. C., Brooklyn, N. Y.
 "... Received my 1st copy of BARGAINS the other day and am very pleased, the information you publish may be just the 'shot in the arm' my business needs." — D. S., St. Albans, N.Y.
 "... I have found your magazine very helpful." — W. A. P., Ogdenburg, N. Y.
 "... Received your paper. Thank you very much. It is one of the finest we have ever seen." — F. D., Iowa.
 "... I was the recipient of my 1st copy a few days ago. I am completely satisfied with the periodical. I also wish to express my appreciation to you for having made the magazine available to me. I shall be pleased to continue my subscription as long as the magazine is available." — W. S., Wash.
 "... I have been a subscriber of your 'Bargains' magazine for nearly a year, and very much pleased with it. I wouldn't want to miss a copy of it. So I am sending in the valuable coupon you sent me with \$2.00 in cash. I am so glad to be one of your subscribers." — Mrs. E. L., Richmond, Calif.

PLUS MANY OTHERS!

THE ABOVE LETTERS WERE NOT SOLICITED IN ANY WAY OR MANNER—ALL ARE IN OUR OFFICE FILES! They are the enthusiastic reaction of subscribers after seeing their first copies of BARGAINS!

MAKE FANTASTIC PROFITS!

BUY CHEAP—SELL CHEAP! That's why thousands of smart salesmen, store owners, jobbers, etc. buy this paper! They know where to buy at CHEAPEST PRICES! NO REASON why YOU can't DO THE SAME! Many articles, features every month show you HOW to sell bargains for big profits—if you don't know how!

Bargains as low as 10¢-25¢ on the Dollar!

It's HARD to believe, but IT'S THE TRUTH! Terrific Bargains can save you 40%-80% or more on every dollar you spend!

SUBSCRIBERS SHOPPING SERVICE

Enables YOU to Buy Big Name Merchandise At Tremendous Savings! "BARGAINS" negotiates bargain offers in merchandise AT LOW WHOLESALE PRICES, and then offers them to subscribers only at NO PROFIT! Permits you to buy at dealers prices! This is but ONE feature of BARGAINS!

ONLY PAPER OF IT'S KIND AVAILABLE!

Search your newsstand high and low. YOU WON'T FIND ANOTHER PAPER ANYWHERE LIKE IT! "Bargains" is available by SUBSCRIPTION ONLY. It's the only paper we know in existence that actually lists Bankrupt, Closeout, Surplus offers every month. Bargains so rare and terrific, you'll blink your eyes in amazement!

SAVE Up to \$1000—EARN Up to \$3000!

We HONESTLY think it's possible for you to do this within a year's time. For PROOF... see testimonial letters... or better still, PROVE IT FOR YOURSELF BY SUBSCRIBING.

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Your subscription will automatically include the BIG 1958 CHRISTMAS ISSUES—just in time for the big holiday season. Special issues jammed full of amazing holiday bargains. Imagine being able to buy \$1.00 worth of goods at 15c, 25c or 35c.

JUST \$2.00 FOR 12 BIG ISSUES!

Reg. Price is \$3.00 per year, BUT YOU CAN STILL BUY 12 BIG ISSUES FOR \$2.00! Just 18c per month! Save yourself \$1.00 by subscribing now, AND SEE OUR AMAZING MONEY BACK IF NOT PLEASED OFFER BELOW! Act Fast, this offer is subject to withdrawal at ANY TIME!

Your Money Back IN FULL if the First Issue Doesn't Please You!

"BARGAINS"

Box 591-K, Lynn, Mass.

O.K. Here's my \$2.00 for 12 BIG ISSUES. Rush me first copy!

Name.....

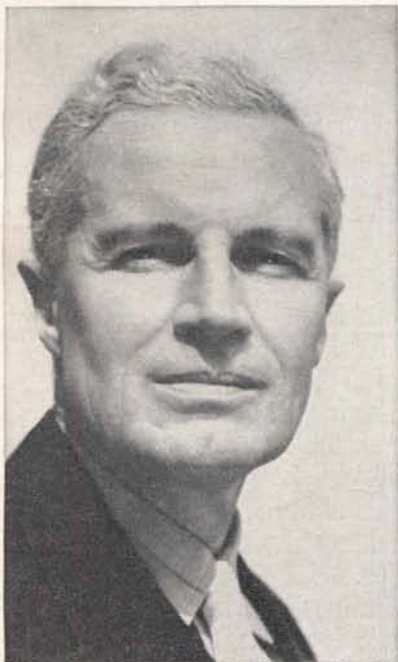
Address.....

City.....State.....

Remember! Your Money Back IN FULL if the 1st issue that you receive doesn't please you!

WHAT CAN YOU LOSE? If you are not delighted with your 1st issue, you can have your money back IN FULL! No quibbling about it either! CAN WE MAKE A MORE STRAIGHT-FORWARD OFFER THAN THIS?

"BARGAINS", Box 591-K, Lynn, Mass.



I'd like to give this to my fellow men... while I am still able to help!

I was young once, as you may be—today I am older. Not too old to enjoy the fruits of my work, but older in the sense of being wiser. And once I was poor, desperately poor. Today almost any man can stretch his income to make ends meet. Today, there are few who hunger for bread and shelter. But in my youth I knew the pinch of poverty; the emptiness of hunger; the cold stare of the creditor who would not take excuses for money. Today, all that is past. And behind my city house, my

summer home, my Cadillacs, my Winter-long vacations and my sense of independence—behind all the wealth of cash and deep inner satisfaction that I enjoy—there is one simple secret. It is this secret that I would like to impart to you. If you are satisfied with a humdrum life of service to another master, turn this page now—read no more. If you are interested in a fuller life, free from bosses, free from worries, free from fears, read further. This message may be meant for you.

By Victor B. Mason

I am printing my message in a magazine. It may come to the attention of thousands of eyes. But of all those thousands, only a few will have the vision to understand. Many may read; but of a thousand only you may have the intuition, the sensitivity, to understand that what I am writing may be intended for you—may be the tide that shapes your destiny, which, taken at the crest, carries you to levels of independence beyond the dreams of avarice.

Don't misunderstand me. There is no mysticism in this. I am not speaking of occult things; of innumerable laws of nature that will sweep you to success without effort on your part. That sort of talk is *rubbish*! And anyone who tries to tell you that you can *think* your way to riches without effort is a false friend. I am too much of a realist for that. And I hope you are.

I hope you are the kind of man—if you have read this far—who knows that anything worthwhile has to be *earned*! I hope you have learned that there is no reward without effort. If you have learned this, then you may be ready to take the next step in the development of your karma—you may be ready to learn and use the secret I have to impart.

I Have All The Money I Need

In my own life I have gone beyond the need of money. I have it. I have gone beyond the need of gain. I have two businesses that pay me an income well above any amount I have need for. And, in addition, I have the satisfaction—the deep satisfaction—of knowing that I have put more than three hundred other men in businesses of their own. Since I have no need for money, the greatest satisfaction I get from life, is sharing my secret of personal independence with others—seeing them achieve the same heights of happiness that have come into my own life.

Please don't misunderstand this statement. I am not a philanthropist. I believe that charity is something that no proud man will accept. I have never seen a man who was worth his salt who would accept

something for nothing. I have never met a highly successful man whom the world respected who did not sacrifice something to gain his position. And, unless you are willing to make at least half the effort, I'm not interested in giving you a "leg up" to the achievement of your goal. Frankly, I'm going to charge you something for the secret I give you. Not a lot—but enough to make me believe that you are a little above the fellows who merely "wish" for success and are not willing to sacrifice something to get it.

A Fascinating and Peculiar Business

I have a business that is peculiar—one of my businesses. The unusual thing about it is that it is needed in every little community throughout this country. But it is a business that will never be invaded by the "big fellows". It has to be handled on a local basis. No giant octopus can ever gobble up the whole thing. No big combine is ever going to destroy it. It is essentially a "one man" business that can be operated without outside help. It is a business that is good summer and winter. It is a business that is growing each year. And, it is a business that can be started on an investment so small that it is within the reach of anyone who has a television set. But it has nothing to do with television.

This business has another peculiarity. It can be started at home in spare time. No risk to present job. No risk to present income. And no need to let anyone else know you are "on your own". It can be run as a spare time business for extra money. Or, as it grows to the point where it is paying more than your present salary, it can be expanded into a full time business—overnight. It can give you a sense of personal independence that will free you forever from the fear of lay-off, loss of job, depressions, or economic reverses.

Are You Mechanically Inclined?

While the operation of this business is partly automatic, it won't run itself. If you are to use it as a stepping stone to independence, you must be able to work with your hands, use such tools as hammer and screw driver, and enjoy getting into a pair of blue jeans and rolling up your sleeves. But two hours a day of manual work will keep your "factory" running 24 hours turn-

ing out a product that has a steady and ready sale in every community. A half dollar spent for raw materials can bring you six dollars in cash—six times a day.

In this message I'm not going to try to tell you the entire story. There is not enough space on this page. And, I am not going to ask you to spend a penny now to learn the secret. I'll send you all the information, free. If you are interested in becoming independent, in becoming your own boss, in knowing the sweet fruits of success as I know them, send me your name. That's all. Just your name. I won't ask you for a penny. I'll send you all the information about one of the most fascinating businesses you can imagine. With these facts, you will make your own investigation. You will check up on conditions in your neighborhood. You will weigh and analyze the whole proposition. Then, and then only, if you decide to take the next step, I'll allow you to invest \$15.00. And even then, if you decide that your fifteen dollars has been badly invested I'll return it to you. Don't hesitate to send your name. I have no salesmen. I will merely write you a long letter and send you complete facts about the business I have found to be so successful. After that, you make the decisions.

Does Happiness Hang on Your Decision?

Don't put this off. It may be a coincidence that you are reading these words right now. Or, it may be a matter that is more deeply connected with your destiny than either of us can say. There is only one thing certain: If you have read this far you are interested in the kind of independence I enjoy. And if that is true, then you must take the next step. No coupon on this advertisement. If you don't think enough of your future happiness and prosperity to write your name on a postcard and mail it to me, forget the whole thing. But if you think there is a destiny that shapes men's lives, send your name now. What I send you may convince you of the truth of this proverb. And what I send you will not cost a penny, now or at any other time.

VICTOR B. MASON

1512 Jarvis Ave., Suite M-6-M
CHICAGO 26, ILLINOIS